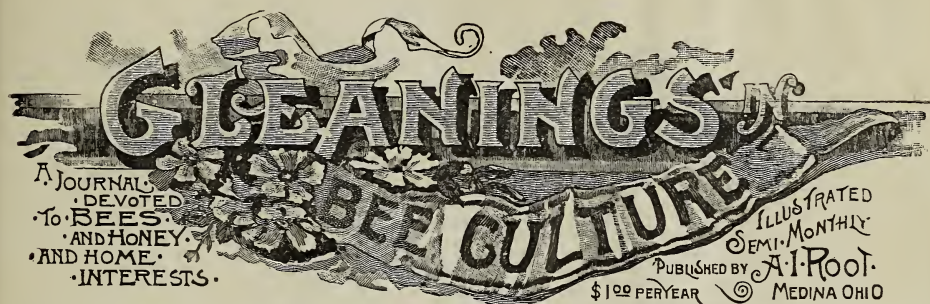


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Vol. XXI.

NOV. 1, 1893.

No. 21.

STRAY STRAWS

FROM DR. C. C. MILLER.

St. Jo. is the place for the next pow-wow.

NOW BEGIN to polish up hopes for next year.

HAULED HOME last bees from out-apiaries Oct. 19. The later the better, so they get one good fly after hauling before going into cellar.

NEVER BEFORE, I think, were so many bee-keepers assembled in one place in this country as at the convention at Chicago. When shall we see the like again?

GALLUP is on the war-path, in *A. B. J.*, with the vigor of old, giving heavy blows against extra light-colored bees, quoting Adam Grimm and Chas. Dadant as backers.

THE PREVAILING IDEA, that bees carry ants away from the hives and drop them, E. S. Lovesy says in *A. B. J.*, is a mistake. He says the ant grabs the bee and never lets go till the bee gives up in death, no matter how far it flies.

WHICH END FOREMOST should bees go when being put into a cage? I always supposed head foremost was the orthodox way; but friend Graham, of Texas, told me he saw the young folks at Mrs. Atchley's putting them in very rapidly tail foremost.

"PSZCZOLA," the Polish word for "bee," is "put out" for me to spell, in *C. B. J.* Not much, friend Wilkins; I've no notion of going around with a broken jaw. Possibly I might try it if the last half of the word had its vowels extracted, so as to be like the first half.

HASTY, in *Review*, seconds Phin's dictionary in objecting to the use of the word *hatch* as applying to any thing except hatching from the egg; instead of *hatching* brood, *emerging* brood being the proper term. He's undoubtedly right, unless a b-ttter word than *emerge* can be suggested.

HONEY is of a gallant cleansing quality, exceeding profitable in all inward ulcers in what part of the body soever; it opens the veins, cleanses the reins and bladder. I know no vices belonging to it, but only it is soon converted into cholera.—*Nicholas Culpeper*, A. D. 1653.

HOW EASY it is to make a wrong impression! I find that I have given the impression that I got a big crop of honey this year. I didn't. A fine flow of honey is one thing, and a big crop quite another. The fine flow was here, but I didn't get the big crop. Hadn't the bees. Died last spring.

ONE TROUBLE with the Chicago convention was, that there were so many there that one hadn't time for half the visiting he wanted to do with each one. Some that I'd been wanting to see for years were there, and I'd only time for a few words with them; and the same with many old friends.

PITY every thing in the bee-keeping line could not have been in one place at the World's Fair. Many bee-keepers never saw the fine honey from England, it being in the British exhibit among other things, and there were other interesting apiarian exhibits scattered over the grounds.

ANTS, according to E. S. Lovesy in *A. B. J.*, are kept out of hives by setting the hives on posts. He paints a two-inch ring around each post, putting on two or three coats of tar as a body, then a mixture of equal parts of lard, axle-grease, and tar, with one-ninth white lead, renewing if necessary.

KILLING BUMBLEBEES, according to a correspondent of the St. Louis *Globe-Democrat*, is a laudable enterprise, and he somewhat gleefully tells how a farmer destroyed several colonies. But after that farmer gets all the bumblebees killed off, he may wonder why his red clover doesn't seed any better.

A SWARM-ANNOUNCER is described in *Centralblatt*. It is a patent electrical arrangement. An entrance of $\frac{1}{8}$ is allowed, over which hangs a swinging gate, and the swarm crowds open this gate and sets a bell to ringing in the house or office. Non-swarmers and self-hivers must fail in this country before announcers get a hearing.

AUSTRALIA, as represented by J. W. Pender at the convention of Chicago, must be a land flowing with honey, however it may be with milk. Think of an average yearly crop of 224 pounds extracted to a colony, with a price of 5 to 8 cents a pound! But even at that rate it would take the proceeds of a good many colonies to bring a man 12,000 miles to a bee-convention.

ELIAS FOX, on page 782, says government helps farmers in protecting domestic animals against diseases, and seems to think that's all. Why, what is there in the line of farmers' work that government has not experimented on? Full particulars as to how and when to plant potatoes, how far apart, which end of the potato for seed, how many eyes, etc., and so of every crop the farmer raises—except honey.

CUCUMBERS don't give bees cholera morbus in this region, Bro. Pryal (see p. 781)—at least, I don't see them going around doubled up with

their hands clasped below their waists any more when cucumbers are in bloom than at any other time. But I am sorry to say that, after several years' experience, I am losing faith in the cucumber as a honey-plant. With four or five hundred acres around Marengo this year, I have seen no very marked results.

VARIOUS DEVICES have been discussed for carrying bees, and some of the brethren have rather scoffed at the idea, saying that, when you wanted to carry a hive of bees, the way was just to pick it up and carry it. I could sympathize with their views as I watched my son, a stout young fellow, loading and unloading bees with no straps, ropes, or other device, this fall, doing it rapidly with apparently little effort; and for him, that's the best way. But, alas! we don't all have the strength.

TWO NUCLEI IN ONE HIVE.

UNITING, ETC.

If the reader will turn to page 252 of the April 1st number of GLEANINGS for this year he will find these words: "As this article is already long enough, I will tell some other time how I keep two nuclei in a hive, how I double them for winter, etc.," at the close of my article entitled, "What Size of Frame shall we use in Queen-rearing?" It had nearly slipped my memory during the hurry of the summer months; but I guess this article will be in time for the larger part of our queen-rearers, as the most of these live farther south than I do, and I have only just finished uniting my nuclei. Several years ago I made a lot of hives especially for working with the side and top storing plan combined, for comb honey, as was given to the readers of GLEANINGS at the time. These hives were two feet long inside, but the brood-chamber was cut down to the size I wished by using a thin slotted partition, five inches from either end, the side boxes being used in this five-inch space. After I adopted the lateral plan of working for comb honey, given in later numbers of GLEANINGS, I had no use for these hives for comb honey, so I thought to use them for nucleus hives by tearing out the partitions at either end and putting in a thin partition in the middle, the same being solid except a hole bored in the center of this partition-board, said hole to be filled with a plug except at times of uniting. The nuclei, when formed, were placed next to this thin partition, with the entrance at the opposite side at the bottom to prevent robbing, as I gave in that article in April 1st GLEANINGS. In this way each nucleus helped to keep the other warm, and I found that fewer bees would answer for a nucleus in these hives than in those where only one nucleus occupied the whole hive. These nuclei would also build up faster, so that by fall I should, as a rule, have frames of comb and honey built during the season, to an amount sufficient to winter a fair colony of bees; and when the two were put together, the bees would make the fair colony desired. In this way I have half the number of good colonies of bees in the fall that I start nuclei in June, which is an item worth looking after, I assure the reader. When I have decided not to rear more queens, the queens from one side of these double hives are taken to fill orders, and in a day or two the plug is removed from the hole in the thin partition-board, which allows the bees to pass backward and forward as they please, thus becoming acquainted with each other without any danger to the remaining queen. In five or six days after taking out the plug, the whole are taken

out of this hive and set over into a chaff hive and fixed for winter, allowing the chaff hive to remain on the stand occupied by both nuclei during the summer, while the double or nucleus hive is put away till another season. In this way I have my nuclei united without the loss of a single queen or bee, and no trouble about the bees returning to their former stand; and, as far as I can see, they winter just as well as will any colony of the same size.

But it sometimes happens that I am obliged to use more nuclei than these double hives will accommodate, when I use other hives which will accommodate only one nucleus, as has been the case this year. These have to be united for winter also; and as they are nearly always the last formed, and do not build up as fast as those in the double hives, I have to put three or more together to make a colony of suitable size for wintering.

All are familiar with the old ways of uniting bees by drawing the colonies to be united a little nearer each other every day till both occupy the same stand, so that none are lost by returning to the old location, so I will not describe the method more fully here, but will simply say that this was always too much work for me; and to overcome it I have used various ways, such as shutting the bees in their hives, and pounding on the same till they were so scared that they were willing to mark their location anew, when as many as were to be united to form one colony were wheeled together, and all put into one hive. This worked well, but was still too much work; so I brought out the following, which I have used with perfect success the past three years:

When it has been decided not to rear any more queens from certain nuclei, they are prepared for uniting, when taking their queens away, by taking all but two or three frames away from them, if they happen to have more, these frames being placed in the center of the hive, and spread from half an inch to an inch apart, according to the number of bees the little colony may have, making it a point to leave the frames having the most honey in them, so that the united colony may have honey enough for winter.

To unite, we wait till some cold cloudy day, or some morning when there has been a slight frost, or when it is cold enough so the bees have clustered compactly together on the frames we left with them. The object of spreading the frames apart when we prepared them for uniting was, that the bees might cluster on the combs in such shape that they would not touch the hive in any place; for if they do we shall of necessity leave a few bees sticking to the hive; but if spread apart properly, the combs and bees may be taken out without leaving a single bee behind, and carried to the place of uniting, and set right in the hive where we wish. To do this, carefully remove the cover from the hive where the queen has been left, and where the united colony is to stand, so that there need be no delay when we come with the other frames of bees; then go to one of those prepared as above, carefully remove this cover also, when we put the index finger and the finger next to it between the frames, closing upon each side with the other fingers and thumb, when the whole are lifted—combs, bees, and all, and carried where we wish, and set in the hive with hardly a bit of disturbance. It is well to have a veil on, and smoke handy, should they be needed by any blunder of ours; and it is well to keep the cover over the combs in the united hive as fast as set in, else some of these bees will be apt to fly out at us when bringing the next lot of combs. Remove the empty hives from their places so the bees need not find them

on the old stand, and none will go back to be lost.

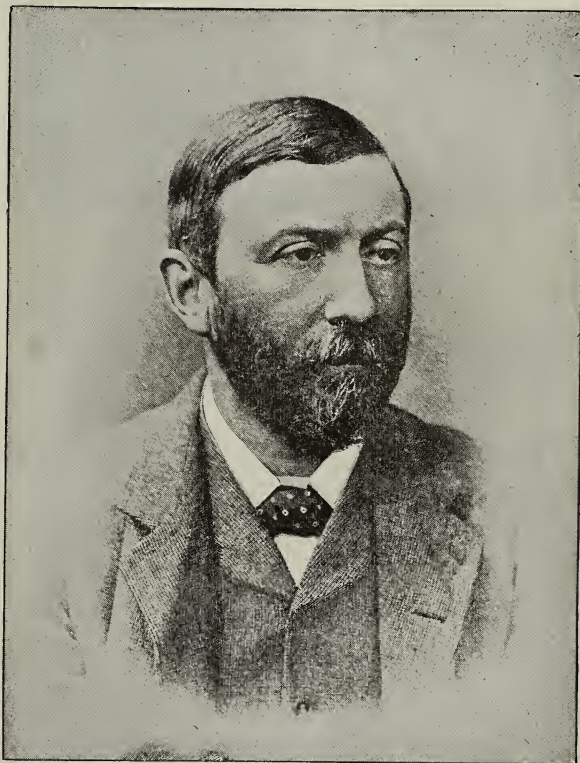
This is by far the easiest and quickest way of uniting bees which I know of, and in all of my practice no queens have been killed, no fighting resulted, and no bees lost by adhering to the old stand. G. M. DOOLITTLE.

Borodino, N. Y., Oct. 18.

[We have been using for queen-rearing an ordinary 8-frame Dovetailed hive. A thin, tight-fitting division-board, that may be removed easily when desired, divides the hive lengthwise through the middle. A nucleus is put in each compartment, with an entrance to each—one at each end of the hive. This sort of hive economizes the heat of the two nuclei, as Doolittle says. In fall we draw out the division-board and let the nuclei unite. The plan so far is very satisfactory.]

special pleasure that we are able to present him to our readers. We will now make an extract from that delightfully written article referred to in last issue from Arthur Smith. Indeed, we believe we will let him tell all the rest of the story.

Born at Welwyn in 1853, Mr. Thomas B. Blow soon advanced to the front rank of progressive bee-farmers. The actual manipulation of bees was commenced by him at the age of fourteen, when he accomplished the delicate task of taking up twenty stocks in straw skips by means of an improved method of applying the sulphur fumes, and using a pair of common house-bellows, with a hollow ball in the nozzle containing the burning sulphur. The idea of saving the bees' lives was then being entertained, and very soon afterward he made his first wooden hives with his own hands, beginning with driven bees with very successful results. These hives were built on the Woodbury principle, being rather massive and cumbrous, weighing one hun-



MR. THOMAS B. BLOW, F. L. S.

ENGLISH APICULTURE ILLUSTRATED.

A GLIMPSE OF THE MANNER IN WHICH OUR ENGLISH COUSINS MANAGE BEES; THEIR HIVES AND GENERAL APPLIANCES; AN INSIGHT INTO ONE OF THEIR LARGEST BEE-HIVE FACTORIES.

Continued from page 775.

We take great pleasure in introducing you to our friend Mr. Thomas B. Blow, a bee-keeper and dealer in supplies in England, of no ordinary distinction. As he probably has the largest supply-establishment in England, it is with

dredweight. Year by year increasing interest was taken in bee-keeping, and we soon find Mr. Blow laying the foundation of his present large business by commencing the manufacture of appliances.

Mr. Blow was one of the first to take the position of an expert, and in this capacity he assisted the late Mr. Peel in the active work of organizing the Hertfordshire Bee-keepers' Association. Many pleasant years of work were carried on without a hitch, until the death of Mr. Peel in 1887. This partnership with his colleague was made by Mr. Peel more especially to promote the industry in the county of Herts, though he himself actively assisted, by means of lectures, etc., to form several similar associations in other parts of the kingdom. At the end of three years the Hertfordshire Association numbered several hundred members; it was referred to everywhere as a model for others, the secret of success being the individual attention given to



MR. BLOW'S BEE-HIVE WORKS AND APIARY AT WELWYN.

each member, and it usually occupied two months to make an expert tour of the county.

A rapidly increasing business demanding more and more personal attention, combined with the fact that, after Mr. Peel had ceased to be connected with the H. B. K. A., Mr. Blow was not in touch with his successors, caused the latter to resign his position. He was one of the very few who ever produced one-piece sections in this country, most elaborate machinery having been designed by him and put down at Welwyn for this special work, one machine alone costing £200. After a somewhat lengthy trial it was found that our native woods were unsuitable for competing with American timber, so this part of his industry was abandoned. Mr. Blow has also designed—as most bee-keepers are aware—a number of important improvements in bee appliances, for which he has received many medals. His mind was, however, quite as much concerned in the study of the bee itself, and, on hearing the fame of Oriental bees, he determined to verify or disprove the many laudatory reports concerning them. With this view he made several journeys to the Mediterranean—principally to North Africa, Malta, Cyprus, Syria, and Egypt. After collecting and bringing home, at the expense of a vast amount of time and money, upward of one hundred stocks from these districts, one season's experience convinced him that the usefulness of Oriental bees in this country was nil, so he promptly abandoned their importation; and, although some persisted in singing their praises, they were ultimately obliged to accept the same conclusion. His next journey was undertaken with a view to inquire into the merits of Carniolan bees, and after a month's investigation in Carniola he was convinced that all that had been said in their favor was well founded. In this district the front of each hive bears a pictorial representation of some sacred, allegorical, or humorous subject, and Mr. Blow has in his possession a small collection of hives so painted. He has traveled through Canada and the United States for the purpose of inspecting the American system of honey-raising. The detailed results of these expeditions have been published by Mr. Blow in an illustrated pamphlet, which contains not only much valuable matter, but many interesting reminiscences.

From quite early years Mr. Blow has taken a deep interest in Natural History, especially Botany, one of his first published works being entitled, "Contributions Toward a Flora of the Neighborhood of Hitchin." To Pryor's "Flora of Hertfordshire,"

published by the Hertfordshire Natural History Society, he is probably the largest contributor, with the exception of the editor, and his extensive collection of British dried plants is included in the Herbarium of the University of Edinburgh. The *Journal of Botany* contains numerous contributions from his pen, and several articles by him have appeared, from time to time, in the *Flora de l'Ouest de la France*. For his valuable services in botany he was elected a Fellow of the Linnean Society, at the meetings of which he is generally present. Like other busy men, Mr. Blow finds time to attend to local matters, and is one of the Guardians for the parish in which he lives.

It is on a lovely summer's day early in May that, after an enjoyable drive through some of the most beautiful of Hertfordshire scenery, an artist friend and myself arrive at Mr. Blow's new works adjoining Welwyn Station. We are at once struck with the suitability of the situation, as, in consequence of its contiguity to the Great Northern main line, all railway passengers can not fail to notice the works and hives. The erection of the new works, cottages for men, residence for himself, in addition to the removal and relaying down of the large quantity of machinery, transportation of several hundred hives of bees, laying out the apiary and planting it with many thousand fruit-trees, etc., etc.—all this has been accomplished and the place put into working order within twelve months—a fact which says much for Mr. Blow's energy and enterprise.

On entering the works where forty hands are employed all the year round, Mr. Blow first conducts us to the portion of the factory devoted to hive-making. Here are twelve different wood-working machines, and a number of men busily putting together the hives, which will soon find their way all over the world. The first element in the success of bee-keeping is a properly constructed hive; and not only this, but one that will withstand climatic influence. The latter desideratum can be obtained only by having it made of the best seasoned wood, and, in order to secure this, Mr. Blow never works up any wood until it has been stacked in his own sheds for at least three years. A hive badly constructed in the first instance, or which has been made of "green" wood, is often the cause of people giving up bee-keeping in disgust. The latter kind of hive gives every encouragement to "propolizing," and when manipulation is attempted the removal of frames, etc., is attended with difficulty;

considerable force has then to be used, frames and combs are broken, hives are jarred, and the operator is compelled to act more like a burglar breaking into an iron safe than any thing else, with the result that the bees are thoroughly maddened with rage, and their owner soon brought into a similar condition. On the other hand, with every thing properly fitting, there need be no more fuss required in taking out a few frames or sections from the hive than books from a library shelf. Of course, the old-fashioned straw skeps are now little used, although the demand is (much to our surprise) sufficiently great as to cause Mr. Blow to employ a man regularly in making them.

The greatest departure that modern bee-keeping has made from the old method is in the use of wax "foundation," to the manufacture of which we are next conducted. This is here produced with as much care as butter in a model dairy factory; the thermometer is used at every operation, the quality and general satisfactory nature of the complete "foundation" being dependent on the temperature at which the melting, dipping, and rolling are accomplished. The larger portion of the wax used comes from abroad, as the production of English wax is necessarily limited; Madagascar, Chili, and India each sending a considerable quantity. African wax is often adulterated in a unique manner by the natives, who suspend blocks of quartz or other heavy rock into the melting-pot with the wax, which, of course, can not be discovered until the block of wax is remelted or broken. Australians (not the aborigines) adulterate the wax itself by melting mutton-fat with it. Mr. Blow, however, takes good care that nothing but pure wax be used on his premises. That from India is colorless, the absence of color being due to bleaching, and it is used to lighten the hue of the darker wax in making "super foundation."¹⁴

Mr. Blow's arrangements for the manufacture of foundation are on the newest and most elaborate scale. The wax is first melted by steam in a large cauldron, so that it is impossible to exceed a certain temperature, and during this process it is clar-

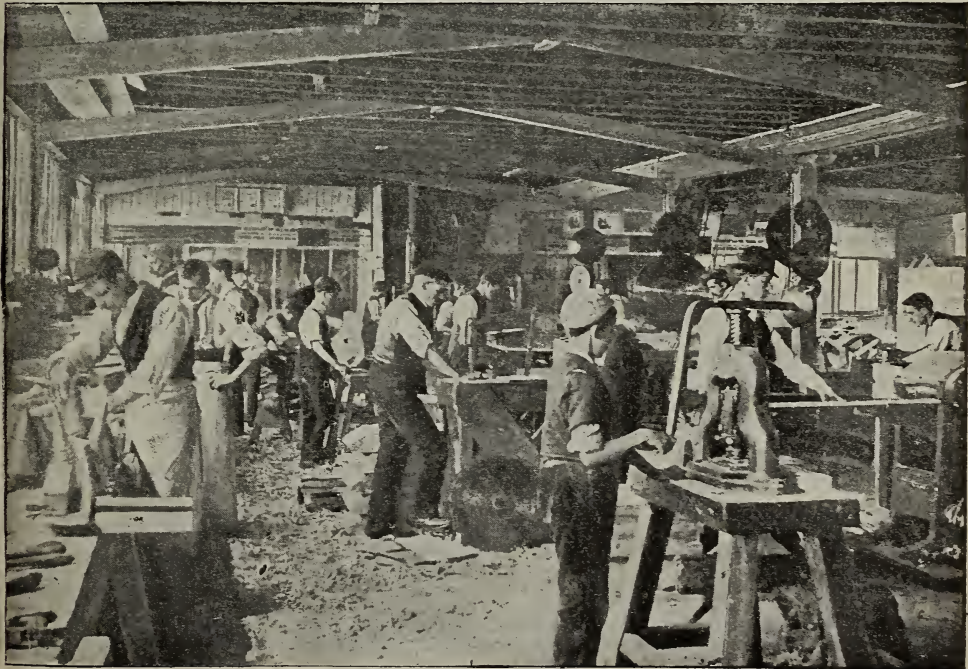
¹⁴"Foundation" is mainly divided into two kinds, brood and super, the difference being in the color and thickness of the sheets.

ified, after which it is strained into a deep, oblong vessel, where it is still kept in a liquid state by steam. The sheets are prepared by dipping smooth wooden boards (which have been previously dipped in water of a temperature of 63° F. and drained) into the melted wax and quickly withdrawing them, and then the sheet of wax is readily stripped off. The next process is to impress each sheet with the *facsimile* of the basis of the cells, and this is done by first placing it in a trough containing water at a temperature of about 100° F., then passing it through embossed rollers, the latter being heated to a temperature of 70° F. Mr. Blow dispatches twenty tons of foundation per annum, and is proud of the fact that there has never been a complaint as to its quality. There is a great deal of adulterated foundation in the market, which appeals to some by reason of its *apparent* cheapness, but those who have tried it soon discovered that, in comparison with the pure wax, it is dear at any price.

On the same floor we are shown several metal-working machines, most of them having been designed by Mr. Blow. Metal section-cases, of which a quarter of a million are now turned out yearly, pass through several of these machines. The "smokers" are made of tinned steel, with the best quality of morocco for the bellows. Some idea of Mr. Blow's connection can be imagined from the fact that, up to the present, he has sold between forty and fifty thousand smokers; and as each of these, with fair usage, will last many years, it is fair to assume that nearly every order for a smoker comes from a fresh customer. In this department we see excluding zinc, dividers, metal tops for feeding-bottles (for the use of bees, not babies), and various other metal fittings.

Mr. Blow shows us, in passing, his simple gas-making apparatus, which turns out splendid gas at the cost of 5s. per thousand, the price charged by the Welwyn Gas Company being the extraordinarily high one of 6s. 8d. per thousand.

On the next floor we find the making of bar-frames in full swing. Here are tiers of crates containing glass bottles, "sections," etc., and at one side are stored bee-appliances of all kinds, too numerous to mention. For the past twelve years an annual average of one million sections has been



THE FACTORY—MAKING BAR-FRAME HIVES AND BEE-KEEPING APPLIANCES.

sent out from these works. We are much pleased with Mr. Blow's new patent section. Among apiculturists it is well known that for some time attempts have been made to introduce sections with glass dividers, so that, after these sections were filled with comb, they could be removed with the glass attached, and thus be ready glazed for market. Previously the great drawback was that the glass has always been inserted in grooves, so that, when the honey was completed, the glass could be removed for clearing only with difficulty, and was often broken. To send sections to market with the glass soiled by the constant traffic of the bees over it would reduce their chances of finding a ready sale. After numerous trials, Mr. Blow devised an ingenious expedient—one so simple that, as he said, it seemed surprising that it should not have been discovered before. A rebate is made in the corners of the section, so that the glass has only to be dropped into position, and, when the section is full, the glass is easily lifted out, cleaned, and replaced, while a neat label all round not only affords a suita-

ble finish but keeps the glass in its proper place. Each section has to pass through eight different machines during its manufacture.

Next we come to the packing and forwarding room, from which a large truck is being loaded. Mr. Blow's goods find their way to many parts of the world, substantial orders often coming from the Cape, and a few days before our visit a large selection of appliances had been ordered for the Khedive of Egypt.

The question of railway rates is one in which Mr. Blow is naturally much interested; and if any material rise take place it will have the effect of considerably checking, if not wholly annihilating, this industry.

As an adjunct to his other business, Mr. Blow has established a large trade in bundles of firewood. A considerable number of boys are employed during the busy season in the spring and summer for whom it was impossible to find labor during the winter. To obviate the necessity of throwing them out of work, Mr. Blow hit upon the expedient of thus utilizing the waste wood from the factory; but as it is of all shapes and sizes the cost of cutting and tying into bundles proved to be much greater

than the completed bundles could realize. Therefore, in order to make any profit, it was found necessary to carry it out much more extensively, and, accordingly, special machinery was put down and wood purchased for the purpose. About 20,000 bundles are turned out per week, a smart boy tying 1000 bundles per day, and earning from ten to twelve shillings a week. These boys are thus kept in employment all the year round, and the bundles they produce are dispatched in truck-loads to all parts of the country.

Descending to the ground floor we pass out into a detached workshop where the metal ends for the bar-frames are being cast. Here we find a very simple and ingenious arrangement for melting and molding the metal by means of an oil-lamp, the burner of which, being constructed on the Bunsen principle, burns with a blue flame, and is capable of melting 40 lbs. of metal per hour. The mold is held in the hand of the operator, who lets in the molten metal, opens the mold, and turns out the complete ends as quickly as shelling peas.



MAKING STRAW HIVES.

We now visit the bees, for whose assistance the hive of industry we have just inspected is kept going. Between two and three hundred hives are placed on a gentle slope and arranged in horseshoe form, while between each row of hives there is a gravel walk and border planted with fruit-trees, among which have been sown seeds of honey-producing flowers. It has a southern aspect, and is situated a few hundred yards above the river Mimram, which meanders through the lovely valley. In a season like the present the proximity to the river is very important to the bees, as in any season they must have water. Altogether, it does not seem possible to design an apiary in a more perfect manner.

Among the fruit-trees are several hundred gooseberry bushes from one to two feet high, and which cost a penny each last autumn. They are absolutely laden with fruit, many of them containing as much as two quarts, thus strikingly exemplifying the value of bees to fruit-growers. The presence of a few hives—the more the better—in the vicinity of fruit gardens and orchards is not simply a benefit to the grower, but is a matter of the first importance; and those who wish to secure the nearest approach to constantly recurring profitable crops

approach to constantly recurring profitable crops

approach to constantly recurring profitable crops

will find it an absolute necessity to encourage the presence of the honey-bee.

The stock of bees at the time of our visit is getting comparatively low. This is not to be wondered at, for Mr. Blow disposes of upward of two hundred stocks annually, and no swarms have yet appeared by which to replenish them. In reply to an inquiry, we learn that, after testing all varieties of bees, hybrids (that is, English bees crossed with either Italians or Carniolans) are better than any pure breeds, the latter cross being much preferable. Mr. Blow devotes a considerable amount of attention to queen-raising. We were not surprised to hear that he finds English-raised queens much better than imported ones, as naturally the former are more capable of withstanding the changes of our climate. Apart from this, he has found it necessary to give up importing queens, because foreign ones can no longer be depended upon. The increased demand of late years has made the raisers unscrupulous, who either send old queens or unfertilized young ones. Mr. Blow's apiary of English bees is a few miles distant.*

DRONE-CELLS FOR QUEEN-CUPS.

AN OBJECTION TO THEIR USE; AN INGENIOUS WAY OF EXTRACTING THE ROYAL JELLY FROM CELL-CUPS; POSSIBILITIES OF PRODUCING LARGER QUEENS.

Mr. Root:—Page 635 of your August 15th number contains an article, "Queen-cells from Drone Comb," indorsing the Alley plan for grafting cells to hatch queens. Having experimented extensively in the different methods recommended for queen-rearing, this disclaimer asserts that, in his opinion, no method yet contrived can equal the Doolittle cup-cell in producing large valuable queens. Apiarists are aware that worker-cells average $\frac{3}{16}$ of an inch in diameter, while drone-cells are $\frac{1}{12}$ flush; also that all drones matured in worker-cells are much smaller than those hatched in drone-cells. It is fair to assume that a queen reared in a drone-cell would invariably be much smaller than if reared in a queen-cell, the measurements of which are generally $\frac{3}{16}$ or $\frac{1}{2}$ of an inch in diameter, and round, therefore longer than a hexagon of the same diameter. It is true, also, that the smaller cells always produce the small queens.

Taking into account this difference in the size of cells, I was induced to experiment with a larger cell, of which the Doolittle cups afforded the only means of enlarging (satisfactory to the bees), to produce a superior queen bee that would not pass through Dr. C. C. Miller's zinc excluder, even in virgin purity. It looks reasonable to suppose that an increase in size would add value to the bee, in the enlarged capacity for eggs, and therefore a prolonged usefulness, as doubtless all germs of eggs are of equal size in a small or large queen. Following up the experiment, cells were used $\frac{1}{10}$ of an inch, from which were hatched very superior bees as to size, exceeding the average of natural-swarmling production; and then the poetry of motion of her majesty on the combs at work pleases the eye of the connoisseur.

It is unnecessary to place the cups in the hive to be notched by the bees before introducing the jelly and larva. By the use of a glass

instrument called a dropper, costing a dime, the jelly can be placed in the bottom of the cups as fast as one can pick up tacks. The bar holding the cup can be placed on the knee of the operator, while before his face, at an angle of about 25 degrees, is placed the frame from the hive containing brood to be transferred. Having cut away the quill one inch from the point, half the diameter, with it break down the lower wall of cell containing the larva wanted. This enables you to incline the quill and scoop out the larva without danger of injury.

By this management the larva is transferred without trouble and without any material injury to the comb, which is then placed back in the hive without commotion among the bees. It is doubtless a fact that improvement can be obtained in this line of work, which will enhance the value of queens. In improving my bees, as pure strains as possible are obtained from various sources, and the difference in the size of the queens obtained demands improvement in the method of breeding. Just before the cups are converted into cells, and capped, those having the least jelly should be removed, and the jelly used to start other cells.

HOW TO PRESERVE ROYAL JELLY FOR FUTURE USE.

If you are not ready to do so at the time, suck out the jelly with the dropper, and deposit it in a wax cup formed the same as cell-cups are, $\frac{3}{4}$ inch in diameter, and $\frac{1}{2}$ to $\frac{3}{4}$ inch deep. Cover by using a small piece of tin heated. Shave off the top of the cup, and this will cause a thin film of wax to be spread over. Press down on the cup, and two or three days may elapse, when the jelly can be used if kept from the air. In dipping the cells, use slightly salted water to dip the stick in before dipping into the wax. It is grateful to the bees.

Des Moines, Ia., Oct. 5. JAMES CORMAL.

[Our correspondent's objection to drone-cells for queen-cups, as recently suggested by Mr. J. D. Fooshe, does not seem to be sustained by the facts. Mr. Fooshe is quite an extensive queen-breeder in the South, and rears for us the larger part of the queens that come from the South. We have carefully examined the queens that have come from these drone-cell cups, and can assure our correspondent that they are not one whit smaller than and in no respect inferior to queens reared by other methods. It should be remembered that the drone-cells themselves form just a mere starter for the bottom of the cell; and, if we understand Mr. Fooshe, the bees soon enlarge it, making it into good-sized queen-cells.

Our friend Mr. Cormal has struck upon a very ingenious way of extracting royal jelly from the cell-cups. We never before thought of the dropper (or, as it is often called, "pipette") for this purpose; but we feel certain that it would do the work far more satisfactorily and expeditiously than any other method. They can be obtained at drugstores, usually, at from 10 to 15 cts., and we suggest the wisdom of Southern breeders—particularly Mr. Fooshe and Mrs. Atchley—testing the pipette immediately, and reporting on the same.]

WAXING QUEEN-CAGES.

PREPARING THEM FOR SHIPMENT, ETC.

* Mr. Blow makes the following acknowledgments to different parties who assisted him in getting together the above fine lot of engravings: To Percy Lund & Co., proprietors of the "Practical Photographer," for two photo-blocks; to Messrs. Newton & Co., Fleet St., London, for permission to make blocks from their fine series of photos on "Bees and Bee Culture," for the use of technical classes. The portrait of Mr. Blow himself is from a negative by Maull & Fox, of Piccadilly, London.

When queens are reared by the hundreds and even thousands, the breeder must make every move count, and even then he sometimes has more work than he knows how to get through with. I have, from necessity, picked up several

little time-saving devices, and will try to explain some of them.

It is an established fact now, that the feed-hole in a queen-cage must be waxed; and to do this rapidly I fill the oven of the cook-stove (that is, cover the bottom with one layer of cages), having the feed ends all in one direction (*from* you as you take the cages out). Get the cages as hot as you can handle them, and have some hot wax in a basin or tin pan on the stove before you. Now take a seat directly in front of the oven, and take a cage out with your left hand. Dip a teaspoonful of wax with your right, and hold the cage at an angle of 30 or 40 degrees, feed end down, over the wax-pan, and top (or open) part of cage turned slightly toward you; pour in the wax; turn the top of the cage quickly *from* you; lower the upper end slightly, and dump the wax out quickly on the side from you, and drop the cage on the floor (have a paper to catch the wax that drips out, or your wife may dump you and the wax and cages all outdoors). With a little practice you can wax them very rapidly, and very little of the wax will be in the queen's "living-rooms" or on the outside of the cages.

By having the cages hot, the wax penetrates into the wood, and is not so unsightly as when it is put on to cold wood.

Now you have your cages waxed, we will put in the candy and get ready to catch the queens. Have your candy made up two or three days before you want to use it, and just stiff enough so that it will not run or look watery on the outside. Get as many cages as you want to use at once, and pick the cage up in your left hand and put the candy in with your right; smooth it off with your thumb, so the hole is just full, and lay aside, etc. Now cut as many pieces of foundation as you have cages, and, if convenient, lay them out on the top of the reservoir on the stove (or anywhere that they will get soft, but not too soft to handle). Put the wax on; press it quickly all around with your thumb, and lay aside. Now get your wire-cloth covers (as many as you have cages) and put them on, leaving them drawn back far enough at one end to admit a queen easily; fasten the wire on by putting a $\frac{3}{4}$ -inch rubber band around the cage. As you put the queens in, slip the wire over the cage, and the rubber band will hold it. Continue until you have the cages all full; then take them to the house (or wherever you have a workbench) and drive four $\frac{3}{4}$ -inch flat-head wire nails, one in the upper left-hand corner, and another a little to the right of the middle of the upper edge; another in the lower right-hand corner, and another a little to the left of the middle of the lower edge. I use a magnet hammer, as it picks up the nails easier than one can do it by hand. As you nail on the covers, slip off the bands and save them for another time. Get all the wires on, then pile up as many as each customer has ordered (say half a dozen); tack a strip of strong pasteboard along the ends, to hold them together, as it saves putting on extra addresses and cards (or thin boards); put a card on the top one, and address. If the weather is hot, slip a piece of thin wood between the cages as you pile them up, to admit more air.

I recently went into the apiary with eight cages, and in 22 minutes they were nailed up,

addressed, and stamped. I put in from 8 to 25 bees, according to distance and size of cage.

Swedona, Ill., Oct. 10.

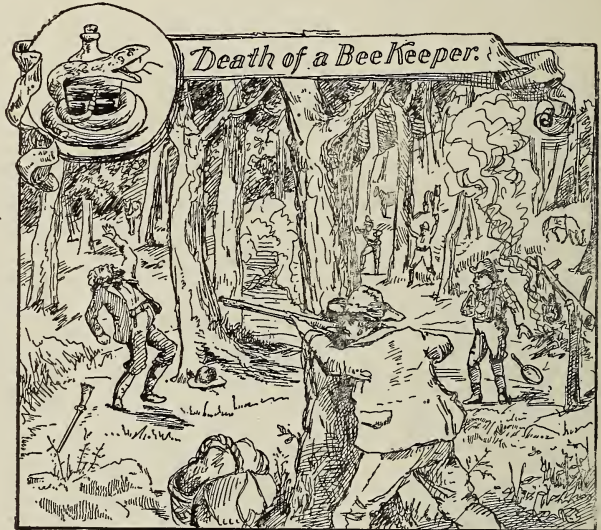
S. F. TREGO.

[Friend T.'s suggestions are good; but if he will use *paraffine* instead of wax, and apply the same while hot, with a small sash-brush, such as painters use, he will do the work more rapidly still. Paraffine melts at a lower temperature, and soaks better into the grain of the wood. We have tried wax, but the other, in our estimation, is far better.]

RAMBLE 95.

THE MURDER OF A BEE-KEEPER, AS TOLD BY
RAMBLER; A HONEY-EXTRACTOR THAT
EXTRACTS BOTH SIDES AT ONCE.

The pigs that sought to put bangs on our hair aroused us, as we desired, at a very early hour; and long before sunrise four hunters with their guns, and mounted on horses, disappeared in the forest. It was the intention to hunt both small and large game. Messrs. Fer-



guson and Wilder carried Winchester rifles, while Mr. Squires, the man with big green goggles, and the Rambler, carried shotguns. Mr. Ferguson took the lead, and our horses had some difficulty in surmounting the steep and ragged hillsides. However, we kept together; and, while clambering down the side of a canyon, Mr. F. suddenly leaped from his horse, threw his gun to his shoulder, and shouted, "Here she goes!" and fired. It was quickly followed by another shot. Friend Wilder had also dismounted, and his rifle awoke the echoes of the forest. We that were in the rear had our minds on deer, and expected, when the firing commenced, to see a noble buck, with antlers broad, plunging in his death-throes through the forest; but, no—the game was nothing more nor less than a mountain sheep. With a bound or two it ceased its earthly career, and in an incredibly short time it was duly dressed and hung up in a tree against the time we should come back. Our next game was a few gray squirrels.

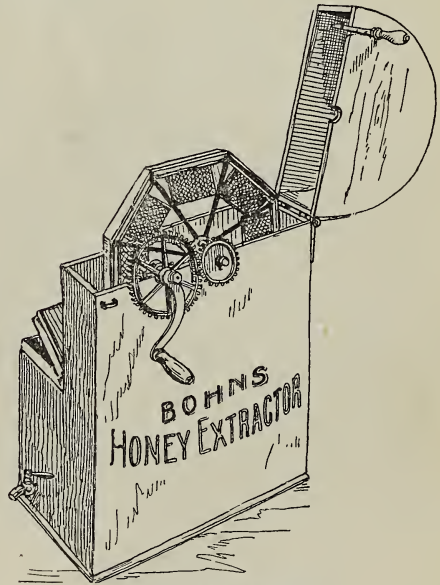
About eight o'clock we entered a beautiful park under the lofty pine-trees, and, picking our horses here, we separated in various direc-

tions, with an understanding to meet at the rendezvous at three o'clock. The Rambler hunted so fast, and secured so little game, that he arrived at the rendezvous at 11 o'clock. That bed of pine needles at the foot of a tall pine-tree, and that delightful shade, and that saddle, so nice for a pillow, were all so inviting that I threw myself down at full length, and, such a refreshing nap as was enjoyed! When I awoke I found Mr. Squires frying bacon over a little fire a few rods away, and we had our dinner. We were just discussing about what we should do about waiting for the rest of our company, when Mr. Ferguson tramped into camp. His game was a gray squirrel. The deer that he went after did not materialize; but he had some very important news for us, and said that he came by the ranch of Fred Heap, about a mile distant, and learned that Gustav Bohn, a bee-keeper, had been killed, shot by Charley Button. Mr. Squires and myself were immediately interested, and, leaving a written notice to our absent hunter where to find us, we saddled our horses and went over to the Heap ranch, and arrived at about the same time the coroner did, and all three of us were immediately empaneled on the jury. Eight jurymen answered for the purpose, and we were conducted to the barn where the remains of Gustav Bohn lay upon a pile of straw, rolled in a blanket.

The uncovering of the body revealed to us a bloody spectacle. The bullet that had ended Mr. Bohn's earthly career had passed through the fleshy portion of the forearm, entering the left breast, and, passing diagonally through the body, came out near the right armpit. Besides this wound and its attendant blood there was a deep gash under the right eye, and the frontal bone appeared to be broken. The story of the killing is, briefly, as follows:

Early one Sunday morning in August four men and a boy met in a camp known as Deep Creek. A man named Clark had a cabin there; and, though he had no license to sell whisky, he had brought in for that purpose fifteen gallons. The four men and the boy set out to have a little Sunday picnic, as they termed it, and were going a few miles further to Fish Camp to hold it. Previously to starting, the treating process was indulged in, and the party began to feel remarkably well. There was, furthermore, a quart and a pint bottle taken along for future use. The principals in the tragedy, Mr. Bohn and Mr. Button, were strangers to each other, having met here for the first time. From the first their conversation took a chafing turn, and continued to increase in acidity as the party proceeded, and as they from time to time stopped to partake of the contents of the pint bottle. The party were all mounted, and Mr. Bohn had the quart of whisky in his possession. On the way to Fish Camp, Mr. Bohn fell from his horse, being partly dismounted by a lead horse. Arriving in camp, the horses were unsaddled and picketed. The lad, who had not drank any of the whisky, and who was the only sober one in the party, was directed to build a fire; and, while gathering the wood, he saw Mr. Bohn lie down with his head on a rock. Button and Bohn continued to bandy profane and angry words, and Bohn, having lost his quart bottle of whisky, accused Button of stealing it. This angered Button, so that he shouted to Bohn to stop his talk or he would smash him. This only angered Bohn the more, and the volley of words continued; and, besides, Mr. Bohn laid his hand on the hilt of a dirk-knife which he carried in a sheath in his belt. Button, suiting his action to his words, kicked (or, rather, stamped) Bohn in the face with his heavy nail-clad shoe, making the se-

vere wound before mentioned. Bohn immediately staggered to his feet with dirk in hand, and with blood streaming down his face; but Mr. Heap snatched the knife away from him, and threw it into the bushes. Mr. Bohn then grasped his gun, which was leaning against a large pine-tree, and, raising it, snapped it at Button. There was no cartridge in the chamber; and as he moved the lever to throw a cartridge into place, Button leveled his rifle. The men shouted to Bohn to put down his gun, but he drew it to his eye; but before he pressed the trigger, Button fired. Bohn dropped his rifle, threw up his hands, stepped back three steps, and fell upon his back a dead man. This unlooked-for event had the effect of sobering the party somewhat, for they were in a state of deep intoxication. Not one of them had the courage to stay with the body in that lonely camp until the coroner could be summoned; and the ghastly operation was performed of lashing the dead body to the saddle that had brought in a live man, and he was thus carried to the residence of Fred Heap, where we saw his remains.



BOHN'S EXTRACTOR.

The jury of eight rendered two verdicts. One said that Mr. Bohn came to his death by a gunshot wound at the hands of Charles Button. The other four, evidently taking a little different view, desired to exonerate Button by putting in the plea of self-defense. The court afterward, in the preliminary examination, held that Button was blamable to such a degree that he was put in jail without bail, and is now awaiting trial upon the charge of murder.

After the coroner's jury arose, the body was rolled in blankets again, and taken to San Bernardino for interment. The little log cabin in which we held our deliberations was perched upon one of the most picturesque points upon the top of the mountain. All of the valley below, with its towns, was before us, while fully 60 miles away we could see the haze of the Pacific Ocean, and the little mountain projecting through it from Catilina Island.

Gustav Bohn was a German, aged 35, a stout, medium-sized man, with dark complexion, black hair, and full beard. He had been in this country 17 years, and for a few years past has

been quite successful in the bee business. His apiary, located at the entrance of City Creek Canyon, contains 500 colonies. Connected with the apiary is a fruit-farm of 15 acres, and on the mountain he had another ranch with 15 horses upon it. All together his property inventoried \$7000, all earned within a few years.

The general verdict of friends was that Mr. Bohn was a very industrious and exemplary man, and had a host of friends in San Bernardino. He was seldom found under the influence of liquor, and one person said that this was only the second time he had been known to be drunk. Mr. Bohn led the life of a bach, like many other California bee-keepers; and while studying the habits of the bees and their manipulation his mind was busy with inventions to lessen labor, and he had constructed an extractor for throwing the honey from the combs, both sides at once. This principle of whirling the comb edgewise has been tried before; but Mr. Bohn placed his in a wheel, much like a wagon-wheel. Seven combs would fit around the periphery. The wheel was so constructed that 14 combs could be inserted at once. It was provided with heavy gearing, and the operation was so simple and easy that the eleven-year-old boy Claud Henderson extracted with it 12 tons of honey during the past season.

The Rambler parted with the pleasant friends in Little Bear Valley, and returned to Redlands through City Creek Canyon, while friend Wilder returned by Devil's Canyon. My ride was nearly 30 miles that day. The toll-road through the canyon is a most tortuous route, the grade having to take advantage of many spurs of the mountain that led a long distance around them. At the mouth of City Creek Canyon I called at the apiary of Mr. Bohn; but the gentleman in charge, Mr. Bledsoe, said that the extractor before mentioned had been taken to pieces, and the honey-house had also been nailed up for the present, or until the property was disposed of. It is supposed that a patent has been applied for upon the extractor. The reader can get a general idea of how it works from the diagram presented on the preceding page.

A lope of nine miles across the valley landed me safely in Redlands, with no further mishaps than a sunburnt face and a very much peeled nose, the result of the hot sun on the mountain grade. Red noses are sometimes caused by whisky; but whisky does not affect the nose of the

RAMBLER.

THOSE OLD BEE-BOOKS.

ANOTHER PEEP AT THE "GOOD OLD TIMES."

The next book on the docket is a small one of 47 pages, equal to 6 pages of GLEANINGS. It is entitled "Collateral Bee-boxes; or, a new, easy, and advantageous Method of managing Bees; in which part of the Honey is taken away in an easy and pleasant Manner, without destroying or disturbing the Bees." It was written by Stephen White, M.A., Rector of Holton, Suffolk, and printed in London in 1764. This was at a time when the relations between England and America were greatly "strained," and the war-clouds were becoming black. There is something about Mr. White that makes one like him; and the reason which he assigns for following bee-keeping ought to commend itself to all. He fully believes, with Paul, that a man who preaches the gospel has a right to live by it; but his wife's dolorous drumming on the bottom of the meal-barrel reminded him painfully that Elijah was not filling it miraculously as he did that of the poor widow. The following beautiful passage was born in poverty, and

would never have seen the light to bless the world if Mr. White had had the princely income of some of the English bishops:

"The smallness of my cure [pastoral charge] has afforded me more leisure hours than usually fall to the share of a great part of my brethren. Many of these hours, during almost the whole space of a now declining life, have been spent in my bee-garden, with as much innocence, I hope, and a great deal more to my taste and entertainment, than if they had been spent with a gun and pointer [dog] in the fields, or in my parlor with a pack of cards. These fashionable amusements (especially the latter) can afford but little entertainment to a contemplative mind; but the surveying of the works of nature (particularly the instincts and polity of many living creatures and the wonderful methods they make use of for their sustenance and safety) will give a real and high delight to a rational soul; and as it is next to impossible to turn our thoughts to the observation of these creatures without lifting them up at the same time in adoration of Him who formed them, this will, in a manner, sanctify our pleasures, and turn even our diversions into a sacrifice to our divine Maker."

□ Just what Mr. White thinks of implements for preventing swarming may be seen from what he says of the Gedde hive. It seems that this Mr. Gedde drew up a formal approbation of his plans, in the name of the Royal Society, but really without its authority. Mr. Gedde proposed "to free the owners from the great charge and trouble that attend the swarming of bees." Mr. White adds, "That means, in other words, to deprive the poor bee-master of all the profit and one of the highest pleasures he can expect from bees." The trouble was, one man looked at it from a business standpoint, and the other from that of fun. I rather suspect that most bee-men would side with Mr. Gedde. The latter mentions several non-swarmer, but none were as good as his. Mr. White asks, further, with some warmth, "Why should these gentlemen deprive me of a pleasure I so ardently look and long for every spring, and which I am more delighted with than all the other pleasures of the month of May?" Such men ought to be allowed to have swarms in peace; but still his question reminds me of one which was put to me by a German during the crusade in 1874: "Mr. R., would you deprive me, a poor man, of my beer?" I replied, "I would deprive you of that which makes you poor and sick, and is fast making a wreck of you." Mr. White intimates that, if a man really wants a non-swarmer, he need not beat his brains out in devising one. Just get straw enough to make a hive that will hold two bushels, and—there you are! It may be of some comfort to friend Langdon to know that inventors of non-swarmer have not always been successful. Mr. White deposes: "In spite of all our swarm-preventers, behold I see a cloud of bees overshadowing my garden, exulting in the presence of their sovereign." If Mr. White could have looked forward 129 years he would have seen bee-men still discussing the matter. I dwell on this matter so much *in extenso* because the discussion is still before the house.

The Mr. Gedde referred to above was the inventor of what is called the "octagonal" hive, putting it before the public in 1675—about a century before Mr. White's time.

The wanton destruction of bees arouses Mr. White's deepest abhorrence; and although it is not now customary to brimstone them, the following words will certainly tend to inspire all who read them with more mercy for the lower animals:

"No true lover of bees, I am persuaded, ever

lighted the fatal match that was to destroy his little innocents with livid flames, and a smoke that strikes them dead with its intolerable stench, without much concern and uneasiness. Besides, we are not to imagine that the bountiful Creator, who has indeed given us all things richly to enjoy, has likewise given us such an absolute right of life and death over all of his creatures that we may kill them wantonly at and for our pleasure. I know no right we have over the life of the meanest insect or vilest worm that creeps upon the earth, unless the killing of it be in some way or other useful and beneficial to us. We may take away the lives of our cattle in order to support our own; but it would be a criminal piece of cruelty as well as folly to butcher an innocent sheep merely for its fleece, which we might take again and again without hurting it. . . . Avarice often mistakes its own interest. It can never be made to understand that strange proverb, 'the half is more than the whole.' It is more to our advantage to spare the lives of our bees, and be content with a part of their stores, than to kill and take possession."

The above was written at a time when the death-penalty in England hung over a person for stealing a shilling. Few things are funnier than for a press-gang to steal a man for the navy and then hang his "widow" for petit larceny. This government can be justly criticised "along this line" too.

Mr. White disapproves entirely of the old straw hives, and uses a box 9½ in. deep, long, and broad. That would be about equal to a peck and a half. Each hive has a long narrow slit near the top, so that, when two hives are placed together, the bees can go from one to the other as they need room. If they do not need extra room, a board is shoved between the hives. Considerable glass is used, so that the hive has nearly all the advantages of an observatory hive. But Mr. White did not care so much to see the bees at work as he did to know when the moths were beginning their ravages. He speaks of these latter as more to be feared than all other enemies combined.

Our author is rather severe toward the old writers who have suggested that the crop of honey is limited only by the number of bees to gather it. He says that, in his own town, a large one, only seven colonies were kept in his hives and two in other kinds—nine in all. He says:

"I have often thought it very surprising that neither the authors who treat of bees nor the keepers of them ever imagine that any place can be overstocked, or that any one's bees fare either better or worse for the larger or smaller stock that is kept in his neighborhood. They think, it seems, that every flower they see is a never-failing cruse of honey. Let me here acknowledge the bounty of our Creator, and with due thankfulness and admiration confess, that, in some sense, it is so; for when a bee, with its little lambent trunk, has cleared a flower of all its *present store*, another comes, 'tis likely, in less than a minute, and finds *something*; for the delicious juice is continually sweating through the pores of the plant. But it is certain, for all this, that, the more of these guests visit a flower, the worse must each of them fare. They will have the less to carry home, or, which is all one, they must go further and spend more of their precious time before they can make up their burden."

The perusal of this little book has pleased me very much, and I am glad to be able to put some of Mr. White's favorite ideas before a larger audience than he did; for just so far he lives again through us.

W. P. Root.

Medina, Oct. 21.

CALIFORNIA.

AN EASTERN BEE-KEEPER'S EXPERIENCE IN TRANSFERRING; REVERSING COMBS; SECTIONAL BROOD-FRAMES; MOVING BEES.

After using the Langstroth, Quinby, Gallup, American, and Heddon frames for several years in the East, in starting an apiary in this State it was concluded to begin at the lowest notch and adopt altogether another form. Bees, as procured, therefore, had to be transferred from the old into new frames and hives, in consequence of which it was just as well and cheaper to purchase colonies in nail-kegs and soap-boxes as in the best of hives.

If the subject to be first dealt with is a box, it is the best plan to drum upon it, and, with smoke, drive as many of the bees as possible from the combs into a convenient box from which they may be easily shaken down before the new hive when wanted. If it is a movable-comb hive, the queen should be found and caged, and the cage laid among the bees; then remove two or three combs containing brood, and transfer, and hang in the new hive which is to take the place of the old one on the old stand, and then the remainder of the combs are taken out and the bees brushed down before, and allowed to run in the new entrance, accompanied by the queen.

It has become little short of a habit, in cutting the combs loose from the old frames or box, to take them into a warm room to avoid cracking the combs, and lay a heated knife down flat, so as to make a square cut through the top of the comb close to the wood to which it was attached. Then the new brood-frames are prepared with bottom-bars a full inch (or the same width of the other parts of the frame) in width, so when the frame is set up on the bottom-bar, and the wide, squarely cut honey edge of a comb is placed on it, the frame and comb will usually stand alone while the twine is being tied around them. Thus the comb is inverted as to its former position, and it is contrived to have all or nearly of the combs crowd upward against the top-bars; and as this empty edge is clean and workable it is very quickly attached to them; when, otherwise, if the honey or brood edge were above, the honey and brood would need to be cleared away, and some comb removed before a firm attachment could be made, in which case the upper edge of honey will lean heavily out against the strings; or, if the honey edge is narrow, its weight will cause the thin comb below to bow outward and finally break, allowing the honey to fall down. At the same time, the bees assist to make the bad matter worse by cutting the wax out where it strikes the strings, in some cases cutting the combs entirely through.

In using narrow bottom-bars a difficulty is, to make the edges of narrow combs stay on them; and as the bottom slides off on one side on to the bottom of the hive, the upper edge leans outward against the strings on the other, and leaves a wide space from the top of the comb to the top-bar of the frame, when the comb will have ample time to settle, bend, or be gnawed into crookedness before new comb can be built to form the attachment to the top-bar.

It is probable that these difficulties are what cause the use of sticks instead of strings, or the adoption of the Heddon driving method and melting up all the combs and giving sheets of foundation. Strings are easier to get and use, and the bees can usually remove them from the frames.

As the combs rest closely against the top-bars, it requires only two or three hours before

the bees will fasten them with borrowed wax, and at the same time they begin to pick and pull to get the strings loose to drag them out of the hive. This causes the strings to lengthen and diminish until they are gnawed away. Instead of the comb being cut out, the bees take the strings to be the aggressors, and save the combs. A prevalent fault with transferring is the expectancy that the bees are to build new comb to fill up spaces and make the attachment to the top-bars. Bees can not build combs from the word go, but must first consume honey, and wait for the secretion of wax.

There should be nearly as much of the comb in contact with the top-bar as the greatest width of the comb. If the comb is in narrow strips they should be stood up endwise so as to reach both the top and bottom bars; and where one edge contains honey it should be made flat, and the honey placed in a leaning position against an end-bar. Nor should a part of a comb be cut away because it contains honey.

A rather heavy article of grocers' cotton twine is just right. When the strings are too light it will be removed by the bees too soon; and if too heavy it will cause the mutilation of the combs, and the combs are never full of ridges and hollows as when sticks and wires are used.

It is a pleasure to transfer by the "driving" plan; but it is not a good practice during a dearth of honey, when the colonies are not strong in bees, or when the combs contain brood, and it is desirable to save labor for the bees. Then there are also just as perfect combs in the old hives as could be produced from foundation. Last fall I took a colony out from between the studding of a schoolhouse where there were only three combs, but each was 15 x 40 inches in size, clear and straight. There is no reason why transferred combs should not be clear and straight if the implements, frames, and combs are prepared to the best advantage—good enough, at least, for the first season's use, after which they may be elevated to the upper stories, and foundation-drawn combs substituted in the brood-nest.

Up to May 15th the bees were kept in the valley, where they gathered honey from willows, eucalyptus, oranges, and pepper, at which time all but 60 of the weaker colonies and the latest hived swarms remained, while the rest of the apiary was taken into the mountains. On returning, in the latter part of July, the hives in the valley were found to contain 50 to 80 lbs. each of dark, unsalable honey, and it was thought, "What a fine winter supply!" But it was about the 8th of August when streams of honey were noticed creeping out of the entrances, and running off down the hill, and the new occupation was begun of wheeling hives up alongside and dumping the contents, combs, frames, brood, honey, bees, and all, into the solar wax-extractor. This was kept up until about three-fourths of all the swarms whose combs had not been reversed, and which had not been built down to the bottom-bars, were destroyed. Shading the hives seemed to be of little use.

Heretofore it has been my practice, as soon as the combs were built out, usually at the time of the first extracting of honey, to put the frame in a vise and saw the projecting arms off the top-bar, to make it into a bottom-bar; then remove the old bottom-bar and nail a new top-bar on in its stead, thus having the combs securely attached to the bottom-bar before inversion. But this season, having more work than usual, the valley apiary was neglected, with the foregoing result.

When I came to this State, and visited apiaries a year ago, I was shocked at the way the

bees were literally robbed of their winter stores by their merciless owners; but after this experience I have changed my mind, as it is better to lose bees by starvation than by the melting down of the combs.

A few weeks ago, in Ventura Co. I was at an apiary of 140 colonies which yielded 18 tons of honey, and the apiarist said that 40 colonies on wired combs were destroyed by the combs melting down last year, and 60 more starved last spring. These 100 colonies should have produced 25,000 lbs. could they have been saved, which, figuring from his actual yield from the remainder of the apiary, would have given him \$1.00 per comb to pay for the trouble of inverting and securing the fastenings to the bottom-bars.

How to leave in the combs sufficient winter stores and not have the combs melt down, seems to be almost as vexatious a problem in California as the wintering problem is in Iowa. When the combs contain but little honey, and they fall, it results only in crooked combs; but with considerable honey it smothers the bees, queen, and brood, and all is a total loss. To guard against this, many apiaries use combs 9x10, 12x12, with dividing-bar through the center, and 8x12 with and without wire; and this adoption of small and irregular-sized frames is largely the cause of the non-production of comb honey. Small frames are also advantageous in moving bees into the rocky canyons. In Iowa, when bees are to be moved it is usually cool enough to make the combs strong, and also prevent the bees from raising the air to a melting temperature; but here it continues warm all the time, so that a small disturbance makes the warmth excessive. In one instance last June, in moving 100 colonies from the valley to the mountains, where the whole size of the brood-nest was covered with wire cloth, less than ten colonies arrived at their destination alive.

As a result of keeping the bees in the valley, many which were only nucleus colonies of three and four combs on Feb. 1st built combs from half-inch starters so rapidly as to fill two upper stories besides the brood-nest by the 15th of May. Such hives of new combs, partly filled with honey, were almost immovable, except over the smoothest roads; where, if they had been able to stand a rough twenty-mile haul, from 80 to 100 lbs. more honey per colony might easily have been secured. Had the colonies been taken to the sage-fields in March, they would not have built the new combs until the opening of the honey harvest in May.

When an apiary has been established long enough to have surplus combs already built, it may be advised to keep the bees in the sage region permanently; but even in that case, when sage yields honey only now and then a year, and as the valleys yield honey every year, it seems to be highly advantageous to have an apiary readily movable; and instead of using a smaller frame it would seem to be a better plan to put in upright bars in the center and a cross-bar midway between the top and bottom bars, dividing a 9x13-inch frame into four, and a 9x17-inch frame into six divisions. This method is quicker than wiring, and absolutely safe from sagging of combs and warping of foundation, and at the same time adapted to a lightning method of putting foundation in brood-frame divisions with the Daisy fastener.

Probably the best plan of fastening frames for moving is with the notched sticks, or with strips of tin an inch wide having small leaves cut out and bent downward in the spaces. A spacer is needed on each end of the frames on the top, and one under the center of the bottom-

bars. The bent wire described in Langstroth Revised is a good implement also.

These matters may seem to be of little moment; but it is found that there is scarcely an hour in the morning or evening best suited for the loading of the hives on the wagon, to say nothing about fastening of bottoms and covers, frame-fastenings and entrance-stoppers. When we once get off on the rough roads, it is very comforting to be sure that no comb can break down, no colony smother or bees get loose. I may speak about ventilation and entrances in another communication. C. W. DAYTON.

Los Angeles, Cal., Oct. 10.

[If you use self-spacing frames you won't have to be bothered with spacing-sticks and the like. Say, you don't tell us what kind of a hive and frame you are now using in California, after having had experience in Iowa with Heddon, Langstroth, and other frames.]

NEW MEXICO.

AN ENGLISHMAN'S EXPERIENCE.

Mr. Root:—Will you permit me to relate my experience in bee culture? I should be extremely obliged if I could obtain information upon one or two points that have arisen in connection with it. To begin, I must say that, previously to coming to the States, I had no practical acquaintance with the methods that are in vogue here, and I do not remember having seen any other kind of hive in operation than the old-fashioned one pictured upon the cover of your journal, and I knew of no other way to obtain the honey than by destroying the bees; so you will see my knowledge was a long way behind the times. I had formed an opinion, from reading, that the Americans were much further advanced in apiculture than the English were, and that bee-keeping was far more general here than over the water. I have since found this to be true, although I have also learned that British apiculture is in a much further advanced stage than ever I suspected it to be.

Before I left London I had made up my mind that, if this country here was suitable for keeping bees, I would enter upon it as soon as practicable, despite my ignorance of the subject; and so in March last I purchased two colonies of Italian bees and commenced to get experience. I soon became intensely interested—fascinated, perhaps, would be the better word—in my new acquisition; although I was exceedingly timid at first, and every time a bee began to buzz I felt like bolting.

As soon as I saw that they were beginning to bring in honey I placed a super on one of the hives, and this was filled during the month of May.

The other hive I began to experiment upon by dividing it and forming two nuclei from it, but without having any queens. I was anxious for some time lest I had done wrong, and thrown away a lot of time. I watched them closely until they had reared queens for themselves, then I feared lest they were merely fertile workers; but they have proved to be excellent queens in every respect, and produce brood at a rapid rate. Of course, if I had known more of their habits I might have saved a good deal of unnecessary worry.

My next experiment was in driving a swarm to prevent natural swarming; and in this, after consulting the A B C. GLEANINGS, etc., I succeeded in doing beyond my expectations, and have a capital colony from them. I was in doubt as to how I should manage if I had a natural swarm come off, and so my first efforts

were to prevent them doing so, as we have no trees near here upon which they could alight, and I did not wish to run the risk of losing them; but one morning my son came in, saying that the bees were swarming. Fortunately they alighted on some old pieces of timber I had near by, and I quickly got a hive, stole a frame of brood from another colony, and had them quickly fixed up, and now they are doing well, and I am taking a nucleus from them in the course of a few days when I get a queen. I have divided and subdivided until I have eight colonies and one nucleus. I should like to ask if I have divided them too much or too quickly. I am without experience on the subject.

I had heard, and have read in the journals and periodicals, that alfalfa is an excellent honey-producing plant. I should like to ask if this is an opinion only, or is it a fact based upon the practical observation of competent persons. This district is an alfalfa country. It has been in bloom here since the middle of April; but, though I have watched, and my son has watched closely, we have failed to find any bees working upon it at any time; and when it has been in bloom within a few yards of the colonies, I have observed the bees to go in exactly the opposite direction, where there has been no alfalfa within a mile. The honey-flow began in the latter part of April, and continued during the month of May; and as soon as the mesquite-bushes ceased blooming, the flow stopped. The honey obtained was water-white, and of a most delicate and delicious flavor, while the comb also was very white indeed. During the months of June and July the bees in this neighborhood did practically nothing. In one hive they ate up nearly all their stores, but during this month (August) they have been exceedingly busy, and accumulated honey very fast; it is, however, brown in color, and strong in smell and taste, altogether unlike the honey obtained in May. I believe it is obtained from a species of wild sunflower which blooms profusely just now, and there is the same kind of smell with both honey and flower. I may say, that alfalfa has been in bloom the whole of the time from the middle of April until the time of writing, and upon inquiry among other bee-keepers my observation as to bees not working it is confirmed.

I purchased one queen during this season, and introduced her into a queenless colony. She began to lay drones in worker-brood comb, and continued for some time producing beautifully marked small drones. She then changed over to worker brood, and was going on very well; but before the hive was full a queen-cell was started and capped over; and as at that time I had lost a queen I concluded to take the queen from this hive (leave the one capped over to come on), and introduce her to the queenless colony. After a week or so I saw she had begun drones again; and during a period of more than six weeks she produced only drones in worker comb, so I determined to get rid of her at once. I should like to ask what the cause was of her producing the drones, when she was changed over, as already there was a large number of drones in the hive. The queen raised from her is doing excellently, and filling up the hive fast with working bees.

Eddy, New Mexico, Aug. 31. W. HUGGETT.

SHALLOW COMBS.

THEIR ADVANTAGES.

Mr. Root:—On page 537, July 1, 1889, Mr. Heddon says: "If I could get the capacity desired, as cheaply, and still keep the standard length and width, I would not have my combs

over four inches deep. The fact is, the shallower the better." If he is willing to tell why, and you are willing to give his answer in GLEANINGS, I should be glad to have it so.

JOHN S. CALLBREATH.

Rock Rift, N. Y., Oct. 3.

[We submitted the matter to Mr. Heddon, who kindly replies:]

Dear Gleanings:—In response to a solicitation from Bro. Callbreath, I will say that I am as greatly in favor of shallow combs as I was on the 10th day of June, 1889, when I penned the article found on page 537 of GLEANINGS for that year. When I first adopted the Langstroth hive, my brother bee-keepers were all about me expressing apprehensions of dire results from its extremely shallow combs. Time has proven the application, to this case, of the following appropriate adage:

Half of our troubles are half our inventions;
And often, from blessings conferred,
We've shrunk with wild apprehensions
Of evils that never occurred.

No doubt most of your readers are very well aware of the numerous advantages of shallow combs, but very many have been, and some are still, fearful of disadvantages arising from what they are pleased to call extreme shallowness. The work of T. F. Bingham, and those who adopted his hive, invented some thirty years ago, has utterly disproved the theory that combs can be so shallow as to injure the successful living and working of the bees. While the use of Mr. Bingham's hive was never widespread, and is now, perhaps, nearly abandoned, it was not because of the extreme shallowness of the combs, which were only 4½ inches deep, but wholly for other reasons. He used 8 frames, 22 inches long; and his method of combining these combs, or, I might say, his hive construction, didn't come into general favor. I used one of his hives eight years, and I wintered a colony in it outdoors eight winters; and while several were very severe, and many colonies in my apiary died, the one in this small brood-chamber, with its extremely shallow combs, never showed even any sign of disease, except once, when it died with the winter malady, the same as others. My experience and observation warrant a positive belief, something akin to absolute knowledge, that extremely shallow combs are not excelled by any other, for safely wintering the bees. We are all aware of the fact that shallow frames are more easily handled, better adapted to the storage of surplus honey, less liable to brace and burr combs, and, I believe, better adapted to early and extensive brood-rearing. While they have other advantages, I will not take the space required to enumerate them, as most of your readers are aware of what they are.

I know, Mr. Editor, you prefer short articles; and since entering the profession I more fully appreciate the reason why; but if the above doesn't seem to you or your readers to cover the ground completely enough, I shall be pleased to go farther.

JAMES HEDDON.

Dowagiac, Mich., Oct. 16.

[Mr. Heddon has told us of the advantages of shallow combs, but has not told us exactly why he would have them *shallower* than his regular combs. We should be glad to give more space to this question, if it is desired.]

THE NORTH AMERICAN BEE-KEEPERS' CONVENTION AT CHICAGO.

A BRIEF REPORT OF IT BY E. R. ROOT.

As I sit before my desk this morning I feel my utter incompetency to do justice on paper

to that mammoth convention that has now gone into history. In our last issue I alluded editorially in various places to the "big convention," little dreaming, however, that the little word "big" would so fitly describe it. I had expected a large attendance, because the Columbian Fair would draw bee-keepers from all over this great land. But if any one had asked me how large the convention would be numerically, I should have said, "Not much to exceed 125." But the records show that there was an enrollment of 225. At the former meetings at which I have been present, 100 has been considered a large attendance; but what may we think of the number at Chicago? It was the most representative gathering the association has ever had or perhaps ever will have. At one of the sessions a show of hands was called for from each State and Province. The following table shows the number of representatives from each as they were called off:

California, 2.	Ontario, 14.
Colorado, 3.	Quebec, 1.
Illinois, 43.	Maryland, 2.
Iowa, 23.	Michigan, 20.
Indiana, 6.	New Hampshire, 1.
Kansas, 1.	Minnesota, 5.
Kentucky, 2.	Missouri, 4.
Nebraska, 2.	Vermont, 4.
New York, 15.	Texas, 3.
Ohio, 30.	District of Columbia, 5.
Pennsylvania, 3.	Australia, 1.
Wisconsin, 9.	Chicago, 8.

Our former conventions have been largely local; and the small attendance even then has been somewhat discouraging to an association having such a high-sounding name—a name that is supposed to take in the whole of the North American continent. As Dr. Miller says in Straws, "There never was a time when so many bee-keepers assembled at one place as at the convention in Chicago; and, we may add, there never was a time when so many *prominent* bee-keepers, who have been known by their writings or large crops, were present together," many of them coming great distances. As the table above shows, there were representatives, not only from far-distant States, but one from Australia, in the person of J. W. Pender—a delegate from the Hunter River Association—a society that occupies a position quite similar to that of the North American. Then we had an attendance of just those bee-keepers whose familiar faces we can not afford to miss—those who have the faculty of enlivening the proceedings and making what otherwise might be a dull and tedious meeting something lively and exhilarating.

The first thing on the program was an address of welcome by Mr. G. W. York. We do not usually publish in our convention reports the full text of an address; but as this is short, and happy in style, we give it entire.

ADDRESS OF WELCOME.

Mr. President, Ladies, and Gentlemen:—

It is with a feeling of sincere pleasure that I am permitted to welcome to our Western metropolis, and at present the Mecca of the world, the grandest association of bee-keepers this continent has ever known. As a representative and resident of "Chicago the Peerless," I offer to you not only "the keys of the city," that shall open the gates to all its pleasures and wonders, but I also extend to you a most hearty and cordial welcome.

Many of those who are here before me have come from distant climes, and are now indeed in a "far country;" but, nevertheless, remember that you are still in your "blessed homeland," and that the same God reigns here as in the sunrise East, in sun-crowned Canada, in the sunset West, or in the sun-kissed Southland. I trust that, during your brief sojourn within our borders, you may all feel perfectly at home; and that, when your conventional labors are ended, your inclinations for sight-seeing be fully gratified, and you return once more to the

loved ones around your various hearthstones; and permit me to express the hope that you may carry with you memories that shall serve as an inspiration in future days to nobler and better living, both for time and for eternity.

I realize that it is no small thing to welcome to our city the representatives of so honored and ancient an industry as bee-keeping; for ever since bees and honey were found in the ribbed carcass of the lion in the time of Samson, until the present hour, honey and its production have been the delight and profit of the sage as well as the peasant; and to-day I know, from my own experience with men and women, that many of the very best people in all the world are devoted to the honorable pursuit of apiculture.

Bee-keepers of America, while the horologe of time is striking the eleventh hour of the century, I bid you welcome to Chicago—the eighth wonder of the world. Welcome, also, to the untold splendors and matchless magnificence of the beautiful "hite City," within whose doors is the most marvelous collection of the handiwork of mankind that earth ever beheld. Yes, welcome to all these, for *all things* are theirs who believe.

Welcome, then, ye bee-folks, welcome!
To our cities grand and free;
May thy meeting prove as "blessed"
As thy little busy bee.

Chicago, Ill., Oct. 10, 1093. GEORGE W. YORK.
Continued in next issue.

QUEENS TO IRELAND

FROM MEDINA.

Friend Root:—Some of your readers might like to hear about the arrival and reception of the queens forwarded by you to the Hibernian Apiary in far-off Ireland, so I shall proceed to furnish some particulars. On Saturday afternoon, July 1, I went to the postoffice, and, to my delight, I was handed the two cages, which, I need not tell you, we examined then and there. In both the queens were lively, and there were a few more dead bees in that marked No. 1 than in the other. The postmaster, who had received reiterated instructions from me as to their treatment on arrival, seemed considerably relieved to know that at last his responsibility was at an end.

After exhibiting them to a lady friend heavily stricken with bee-fever, I proceeded to our church-choir practice, where, after the exercise was over, the bees were duly admired, more particularly by our worthy parson himself.

No. 1 was placed on a comb of sealed brood in a hive long queenless, but regularly supplied with brood from another hive.

No. 2 was introduced under a drone-cage by a plan of my own, which consists in caging the queen of the hive till its inmates are personally aware of the fact, when she is removed, and the stranger is substituted under the same cage. The stranger is then left undisturbed till the bees have again clustered on the cage, when it is usually safe to liberate her. Of course, she must be watched; and if any symptoms of anger are shown she must be again confined till her reception is cordial.

On the following day I liberated them; but as hostilities ensued they were once more imprisoned till the next day, Monday, when they were kindly received.

No. 1, which I took to be of "Neighbor H.'s" strain, and which I destined as a drone-mother, has taken kindly to her duties, and several drones are now in the larval stage in a drone-comb placed for their reception in the brood-nest.

No. 2 is also busily at work, and I hope that, by heather time, which is usually in August, I shall have a goodly band of Italians eager for the spoil.

FOUL BROOD.

I wish to add a word on foul brood. This terrible disease has made fearful havoc among the bees in this neighborhood. I purchased a hive a short time since, transferred them that night, and on examining them by daylight I discovered to my horror that the combs which I had transferred were full of it. As you may imagine, after discovering the plague I lost no time in making preparations to fight it. Fortunately I had on hand Frank Cheshire's invaluable work on bees, and, as I had already posted myself on his foul-brood treatment, I soon had a sprayer at work, charged with a strong solution of carbolic acid. The carbolic fumes quickly drove out the bees. The queen, however, I secured and caged. The bees thus driven from their hive joined two other colonies, and were peaceably received. I was then left with the queen and the combs; the former I dispatched, and the latter were secured and ultimately melted down. I then had to watch the two colonies which the infected bees had entered. By occasionally spraying with a carbolic solution any suspicious spots, I effected a cure. This treatment, I am sure, is the best and most reliable. In all cases it is advisable to destroy the queen, as, in most cases, her ovaries are infected, and consequently every egg she lays contains the germs of the disease.

H. S. G. STEPHENSON.

Cor Castle, Innes Shannon, Co. Cork, Ireland, July 12.

[We have tried this spraying of carbolic acid here at Medina, and it seemed to have no effect.]

HEADS OF GRAIN

FROM DIFFERENT FIELDS.

WOODEN WAGON-WHEELS DURING A DROUTH;
MORE ABOUT LOOSE WAGON-TIRES.

Friend Root:—Since reading yours in Sept. 15th GLEANINGS about "loose wagon-tires," I have thought I might help some one, if not yourself, by contributing my "mite." When I came to Texas, 26 years ago, I experienced the same trouble you speak of with loose wagon-tires. In fact, as we have longer drouths, and the sun shines hotter, the trouble is intensified—more especially so since nine out of ten farmers let their wagons stand out in the weather the year round. However, I soon learned that wheels made of our native bois d'arc (bow wood), when well seasoned, never shrink, but the tires keep tight till the wagon wears out. Nor is this all; for our black limy soil soon destroys oak or other timber, while it has no effect on bois d'arc. No one ever lives long enough to see a fence-post of this timber rot. I have known posts of it shipped 250 miles or more to be used. I now have had a wagon in constant use for six years; and although we have just passed through a severe drouth, the heat sometimes at 102° in the shade, the tires are as tight as the day I bought it; while all along the road may be seen oak wagons with a broken wheel from the tires coming off.

When I came here a bois d'arc wagon cost \$150.00. The one I now have cost \$85.00, all complete with top, box, bows, and sheet and spring seat. A good northern-made oak wagon costs here \$75.

I use boiling linseed oil with good effect on my buggy and sulky wheels. The wheels should stay in the oil about one hour, and should be applied at least once a year. You can get bois d'arc wheels made here, or you

can have the timber shipped north and made up. A good deal is being shipped already.

I like GLEANINGS mostly for its home talks and useful hints in general, as I have but few bees now, and will never change the Simplicity hive for any other.

Honey crop is light here. I aim to raise honey by my own use. J. G. FITZGERALD.

Brookstown, Tex., Oct. 9.

[We are glad to give place to the above letter, even though the principal point is, getting timber from a place as far away as Texas. While reading it the idea kept coming to my mind, that wagon-wheels made entirely of metal would never get loose in dry weather; and, in fact, I have seen wheels with tires five or six inches wide made in this way. I presume they would weigh something more than a wooden wheel; but is it not possible, at this stage and age of progress, to make a wheel entirely of steel as light as one made of wood? I feel quite certain that wide tires of some kind are soon to come into use generally; in fact, the great traveling public can well afford to pay the teamster a pretty good sum of money who will travel the roads with a wide-tired wagon; and the man or woman who rides a wheel could afford to give him still more; for you can follow a wide wagon-track for miles and miles, with scarcely a bump or jar, compared to picking your way where only narrow tires are used.]

SCRAPING SECTIONS.

In our honey-house we have a stove, on the hearth of which I this year placed a board long enough to range four sections facing forward, and as wide as the hearth, to put the cleaned sections on till ready to place them in the shipping-case, which was on top of the stove, all ready for use. In front of the hearth I placed a bee-hive upper to serve as a table; at the right of this a tier of supers—six or eight on a low box, to raise them a little from the floor. On one side of the open a large old tin milk-pail was placed to catch the scrapings. On the other end of the hearth was a chisel to loosen frames with sections; a strong knife for prying; caseknife with straight edge to shove scrapings out of the way or off the board into an old pail; a jack-knife and razor for cleaning sections. I use the first mostly. Having every thing thus at hand I would seat myself on the remaining side of my table, upon which rests a planed board long enough to reach across the table from the old pail on one side, and on the other, close up against me, thus keeping most of the scrapings on the board till I push them to one side, or off with my caseknife into the pail. What does not go I shake or scrape off when I arise to put the clean sections into the shipping-case. Another year we may try Mr. Flansburg's "screen-bridge" or something similar.

Mr. Root, you did a nice thing when you got W. P. R. at those old bee-books. I am more especially pleased that I have been doing something of the same kind for a number of years, only I did not have the books to work at.

Tiffin, O., Aug. 24.

R. MOORE.

VALUE OF THE DIVISION-BOARDS.

In May 1st GLEANINGS Dr. C. C. Miller, in Stray Straws, asks, "Are division-boards of real value?" etc. In reply I would say that they are for certain purposes, to-wit:

1. A small swarm, covering only two to four frames, hived on starters late in the season, will start to build comb in one end or corner of the hive, covering, may be, the corner of five to seven frames, and will, if left alone, start to draw those out simultaneously, slowly and to

disadvantage; and should the honey-flow, and, in consequence, the building of comb, stop abruptly, there would be so many unfinished combs on hand. The proper use of a division-board will prevent this. Confine the swarm by means of it to a space they will comfortably, yet completely, fill, thereby concentrating the heat and their united labor, and you will get full sheets of comb as far as possible, instead of half-finished ones.

2. This applies equally to section honey. When, late in the season, your sections are, probably, not going to be finished, crowd the bees by the use of one to three division-boards inserted into the hive above, and watch results.

3. In wintering, too, I should prefer to have a division-board or two joining the sides of the hive, instead of an empty comb. This is the extent to which I find them useful and will stand up for.

C. WINTER.

Piru City, Cal.

HOT-AIR ENGINES FOR PUMPING WATER.

We ran short of water this summer, and put in a 6-inch Ericsson hot-air pumping-engine, at an expense of \$180. It pumps 225 gallons an hour, and burns two gallons of gasoline in 12 hours. If I had put it in earlier in the season I think it would have nearly paid for itself this season.

Grand Rapids, Mich., Oct. 5.

EUGENE DAVIS.

[I may explain to our readers, that the advantage the hot-air engine has over the windmill is this: With the windmill you must have a large tank or reservoir for storage, in order that you may have water to use when the wind does not blow. With the hot-air engine, however, and a good supply of water, you may pump the water just as you want to use it. Of course, some sort of reservoir is a great convenience, but it need not be of so great capacity as for the windmill. Friend Davis does not tell us how high the engine lifts the 225 gallons of water in an hour. Of course, this makes quite a difference.]

HONEY NOT FIT TO EAT; DR. KELLOGG'S SLANDER STILL AFLOAT.

I inclose herewith a clipping that is going the rounds of the press, and should be glad to have your opinion of it through GLEANINGS. I pronounce the whole thing false, but there are thousands of people who will believe it true.

Fort Smith, Ark., Aug. 22.

Z. WILLS.

[The clipping referred to was given on page 235, 1892. It came from Dr. Kellogg, of Battle Creek, Mich., and is one of the wildest statements that ever came from the pen of a man in his position. Honey, as all human experience proves, besides its place in the Bible economy, is one of the best articles of food; and while some kinds may not be good, it by no means follows that none is good. So far as cleanness and purity are concerned, honey may well be the standard of comparison. Mr. K. is no authority on honey.]

GOLDEN COREOPSIS.

Inclosed are a few flowers of the large flowering Spanish needle. Since I saw it in Iowa in 1890 I have seen it in this part of the State. About three miles from here are two large patches of it, one on each side of the Muskingum River, and about a mile apart. Both are on waste land, with a depression in the ground. I went last spring to look after them, and carried home with me half a dozen little plants and put them in my garden, and now they are a perfect blaze of beautiful yellow flowers, and the bees work on them from daylight till dark, the same as on the scrophularia. That and the blackheart are about all they have just now to

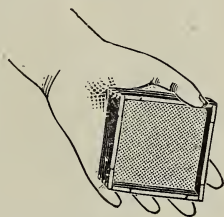
work on. It would be an acquisition to any flower-garden, blooming as it does at this very dry time. But it would not do to call it Spanish needle. Let's call it "golden coreopsis." I haven't seen the needles yet, but I don't think they amount to any thing, as the other kind does.

W. S. IMLAY.

Zanesville, O., Sept. 4.

MY WAY OF SCRAPING SECTIONS.

This cut represents the way I clean sections. With a pocket-knife in the right hand, and by dextrous movements of the left, I can scrape them very fast. A $4\frac{1}{4} \times 4\frac{1}{4}$ is easily held in the hand, but larger sizes can not be.



R. B. KIDDER.
Columbus, Wis.

REPORTS ENCOURAGING.

Here is my bees and honey report. Last winter I lost 2 out of 24; doubled up to 19, and got 400 lbs. of comb honey, and 800 of extracted. One colony made 260 lbs. of extracted.

Peters, Mich., Oct. 7.

FRED A. HUND.

My bees have done very well this season. I got 1200 filled sections ready for market from 32 colonies, spring count, from raspberries, clover, and wild cotton; no basswood here. White clover was very plentiful, and yielded much honey.

J. S. KLOCK.

Urban, Pa., Aug. 1.

ONE HUNDRED POUNDS PER COLONY FOR GEORGIA.

In Sept. 15th GLEANINGS friend Holt, of Americus, Ga., says that the honey crop in his vicinity is a failure. In this section (57 miles southwest) it has been immense. I have had several hives give me 100 lbs. of comb honey, without any attention except to put on sections (or frames in some), with only small starters in them, and take off the honey when I could get a chance.

L. A. DUGGAN.

Cuthbert, Ga., Sept. 27.

REPORTS DISCOURAGING.

Bees have made but very little surplus honey. I have seven stands, and have not had a swarm this past summer, and not over 85 lbs. of surplus honey. This is about the same with my neighbors.

H. M. KUME.

Bancroft, Neb., Sept. 11.

Inclosed please find \$1.00 for GLEANINGS for another year. Although our honey crop was an entire failure this year, I can not afford to do without GLEANINGS. It looks as though our crop of honey for another year would be a failure also. Last winter killed out all the clover that would have bloomed this year. There was a fine crop came up from the seed this spring that would have bloomed next year; but the severe drouth that we are having now, and have had for the last two months, has killed all the young clover, so there will be very little for bees to work on next year in this part of the country, and that is what we depend on for our surplus honey, as we have no basswood here.

Delhi, Ill., Sept. 14.

H. D. EDWARDS.

NOTES OF TRAVEL.

ON THE WHEEL.

But his disciples came and besought him, saying, Send her away; for she crieth after us. But he answered and said, I am not sent but unto the lost sheep of the house of Israel. - MATT. 15:23, 24.

I do not know, friends, but I am getting things mixed up a little in this issue. Perhaps what I have written under the title of Our Homes ought to be here, and this ought to be there. At any rate, I am going to talk to you just now about some of the homes of our land. I had asked Mrs. Root for a very early supper; and while we were eating, there was some talk about my thirteen-mile ride before dark. The barometer was falling rapidly, and the clouds in the west looked rather "portentous of a storm." Mother suggested that perhaps I had better give it up; but I replied there was a special engagement, and that I must get to Wadsworth, 13 miles, in some way, rain or no rain. I remember one of the children saying something like this:

"I really believe father likes to get caught in the rain, or get lost, or get somewhere on the wrong road, just so he can have some new adventures, and something exciting to tell about."

These may not have been the exact words, but it was something in that line; and as my daughter ended, I began to think that she had come pretty near the truth after all. Dear friends, I do enjoy mishaps or emergencies that make it necessary for me to go into the homes scattered about our land. The homes where our people live are a matter to me of great interest—especially the homes of our farming people in this great nation of ours. I sympathize with them and I am anxious about them.

I should not have been quite so late in getting my start, but we have just succeeded in confining the exhaust steam from our 100-horse-power engine so as to carry it through large drain-tiles under ground, from the factory to our home. A pipe containing hot water is supported in the center of this big tile, and the radiators all over the house are now so hot as to blister your hand if you are not careful how you touch them. Not only while the steam is passing through the tiles, but even 12 hours or more after the steam has been shut off, they are scalding hot. Furthermore, we are building plant-beds, and some of them are already planted to lettuce, right over the pathway of this underground passage.

Before mounting my wheel I had to take just one more look and give my last directions to the men who were busy at work on the beds. At a quarter past four I was spinning along the river road on my way. As I reached River Styx, a little more than half way, it began to be quite dark, and I heard the noise of the rushing wind as the great black clouds began to come directly overhead. The road had just been patted down smooth since the rain; and the broad-tired wheels belonging to the German wagons used in that neighborhood made just a beautiful track for the wheel. Even when it got to be quite dark I could see the shining wheel-tracks, and I kept my wheel in the path with but little trouble. Pretty soon there seemed to be a wonderful ease and freedom to my wheel. I went up hill and down as if some unseen power were lifting me and sending me along. Now I have had this feeling before, and I always forget the cause; and it was not until I saw the leaves from the trees whirling along beside me that I recognized that it was the wind from that black cloud that was car-

rying me along almost as if I were flying. You see, the wind was just behind me, and my speed was just about equal to that of the wind. So I sailed along in company with the flying leaves, feeling no wind at all. There is something strange about this—feeling yourself in a dead calm when there is a tremendous wind going along with you. I was thinking I should make Wadsworth in ample time if I could only keep my wheel in the beaten wagon-track. But, alas! the big drops of rain put an end to my flights of fancy. Just ahead of me I saw a bright light. It was so dark I could scarcely see the building; but I knew it was a little piece off from the road. I tried to find the gate, but ran past it and up into the barnyard. By the time I had found the door of the house I was pretty thoroughly drenched with rain. I tried to get the man whom I found there to hitch up and carry me to Wadsworth. But he said his wife did not like to stay alone in the night; and as they hadn't lived there very long, they were not very much acquainted with anybody. In fact, the neighbors had not *been* very neighborly to the new comers.

It was getting late, and I was damp and wet. I do not really relish riding in a buggy any of the time; and then it occurred to me that, before I had the wheel, I used to be pretty good on a walk; so I borrowed an umbrella and was going to start out, when my friends very kindly tendered me the use of a lighted lantern. The lantern was bright and clean. There was not a bit of dust on the tinwork, nor a particle of smoke or soot on the glass; in fact, it was just such a lantern as I should not feel ashamed of, even if I were to go among crowds of educated and intelligent people. Why do I speak of such trifling things? Because they always mean something. I made up my mind that that woman was a Christian, whether her husband was or not; and I got my impressions a good deal from that lantern. My friends, if a stranger should come into your house out of the dark, what would the lantern look like which you would have to offer to him? More of this anon.

I found the roads quite slippery, and I did not make very rapid progress. In fact, it took me over an hour to walk three miles and a half. About a mile ahead was one of those beautiful soft-water springs I have told you about. If I rode in a buggy I could not enjoy a drink from that spring; but by the time I got there with my lantern and umbrella I was quite ready to enjoy a cupful, and to thank God for it.

The town of Wadsworth has, for a number of years, been a "dry," or prohibition town, and this in spite of railroads and coal-mines in the immediate neighborhood. Within the past year, however, some strange state of affairs has come about, and the saloons have been called back—hence this special temperance meeting. I sat a little while by a hot stove, turning myself until I was pretty thoroughly dried, when I was called upon the platform. The house was filled, and the clergymen of the place were together on the platform. Before the speaking commenced, the pastor of the church leaned over and whispered to me something like this:

"Mr. Root, you have no conception of the apathy, indifference, and general discouragement that have got hold of our people here in Wadsworth. The whisky men have crowded on to us, and six new saloons are now bright with new paint, and doing business full blast. A part of our people think there is no use trying—they are too much for us any way. Another part seem to think things are not so terribly bad, and there is no use making any fuss about it; still another part have become discouraged, and do not care. If you and

brother Russell can wake us up to a sense of our shortcomings we shall consider you a God-send."

Howard H. Russell was the speaker. I was simply to introduce him, and to back him up when he seemed to need backing. But I am not going to talk temperance to you just now.

By daylight next morning I picked up my umbrella and lantern, and started back on foot. Permit me to say I did not take a particle of cold; and, like my friend Wilbur Fenn in regard to the potato-bugs, I did not expect to take cold. I have learned, by years of experience, that a thorough drenching by a summer shower does me no harm at all, providing I can keep up some sort of exercise so as to keep warm. In fact, I was just getting over a cold contracted by staying out too long when looking at the fireworks at the World's Fair; but my wetting did not aggravate the cold a particle. As I passed the spring I had another delicious drink of that beautiful soft spring water. If any man who is addicted to intemperance enjoys *his* drinks as much as I do quenching my thirst at these springs that God has given, then I am mistaken. Any way, my drinks are taken with a clear conscience and a thankful spirit, with the conviction that God's love is over and around me. The man who drinks any intoxicant does not have this feeling. Am I not right?

I told the friends I stopped with the evening before, that I should like to take breakfast with them. Accordingly a nice breakfast was in waiting as I came up the front walk. I could find the gate easily enough by daylight. We had potatoes and ham, and fried corn-meal mush with syrup. When I asked them where they attended church, the husband and wife exchanged looks. Finally Mr. T. replied:

"Why, Mr. Root, we do not go to church much any where since we have got married."

The wife looked from me to her husband, and then added with a smile, "Please tell Mr. Root whose fault it is that we have not been to church since we were married."

The latter was not said in a complaining tone, but with an appealing look that I understood. He answered:

"Well, I am hired to work this farm of over a hundred acres, and I do it almost all myself. Of course, we exchange work some, but I am sure I work for them more than they work for me; and on Sunday I am too tired to do any thing but rest and get ready for the work of the next day."

"Look here, friend T., you have been a church-member and a Sunday-school teacher. Now tell me truly, don't you feel a great deal *more* tired when you stay at home than when you attend worship and do your part toward remembering the Sabbath day to keep it holy?"

I had to smile pretty broadly when his answer came out, bright and clear:

"Yes, sir, I have noticed that very thing."

As his wife and I both laughed at his frank, candid admission, he added:

"Another thing, a body feels mean Sunday night, when he has not attended church nor worship of any sort."

Just a mile and a half away was a Methodist church that was in sad need of members. Two miles in another direction was a Lutheran church. The good wife, before marriage, had attended the latter, while her husband was a Methodist. How often we come upon such a state of affairs as this! and how sad it is that the result is also too often the case that they do not go to church at all as a consequence! I advised them to attend service where the wife and mother (a child just a year old sat in a high-chair) felt at home; and as this was Sat-

urday morning I put in an earnest plea to have them take that same horse and buggy that was to take me to Wadsworth, and go to church on the morrow. Mr. T. urged that it was so late in the fall the weather would be bad; but that, when the weather would be good next spring, they would start going to church regularly. I had become pretty well acquainted by this time, and I commenced pleading:

"No, no! don't wait until next summer. Make a start to-morrow. The Weather Bureau says it will be a fine day. I am sure the baby will behave all right; and even if she does not, it will not, by any means, spoil the services. Go and tell that Lutheran minister I sent you."

Here the wife put in, that they (at that particular church) could not afford preaching oftener than once every other week, and the morrow was the wrong day.

"Well, my friends, if you do not go to-morrow give me your promise that you will attend the Sunday after, providing it does not rain. I do not want to leave this pleasant home of yours until I see you both started once more back in the straight and narrow path from which you have been so long straying."

As I rose up I took some money from my pocket, and was going to pay for my breakfast. My host, however, insisted that he would not take any pay from any one who had tried so hard to have them do what they ought to do.

I have seen this state of affairs before. When I have undertaken to exhort people toward God's kingdom and his righteousness they will not let me pay what is justly their due. But this time I was equal to the occasion. I laid a half-dollar on the table, and told them that, if they would not accept pay for the breakfast, they must take that coin as their first offering to the church from which they had so long absented themselves; and I got the promise.

The little incident I have mentioned is what suggested my text—especially the fore part of it referring to the lost sheep of the house of Israel. Go where I may, I find much of this state of affairs—people who used to be church-members, but who have backslidden; and very often they confess, as frankly as did friend T., that there is no happiness nor satisfaction in deserting God's cause. How bright the morning seemed, and how easy it was to spin over the ground after that little bit of spiritual exhortation! I was happy because I had had just a little taste of laying up treasures in heaven instead of on earth, "where moth and rust doth corrupt, and where thieves break through and steal."

Shall I tell you why those six saloons have just started up in full blast in Wadsworth? Why, it is just because Christian people have backslidden and deserted. Do you remember the text from Malachi—"Bring ye all the tithes into the storehouse; prove me now herewith, saith the Lord of hosts"—you know the rest. The whole trouble with the temperance cause—the whole trouble with our nation—is because of the indifference of professing Christians.

Last week somebody went into my neighbor's carriage-house and took not only his double harness, but his single harness; in fact, they stole all the harnesses he had. When I was off on my wheel in the adjoining county of Summit, a relative told me that his new buggy harness had just been stolen. He is not a professor of religion; in fact, he has been known far and wide for being a good deal the other way; but when I said, "Look here, friends, the shortest and quickest remedy for this state of affairs is to start more Sunday-schools, and all of us lend a hand," he said he heartily agreed with me—at least, he believed that the shortest and quickest remedy was to

educate our children so that they should not grow up thieves. I have been told that thieving is getting to be more common all over our land. Stealing harnesses is a new departure, and there are other new departures coming on. Let me give you a hint.

The man who owned the farm where I got my breakfast is the owner of *five* farms. He has five, and his neighbors do not have any. Yes, I agree with a great lot of you who insist that this is a wrong state of affairs; but the blame by no means rests *entirely* with the man who has five farms. What effect do you suppose those six new saloons will have on the state of affairs where one man has five farms and his neighbors do not have any? Will it help matters? And then suppose the people all around get into a fashion of staying at home from church. Will that help matters? Certainly not.* "Seek ye first the kingdom of God, and his righteousness," and all these things will be mended. The Bible says so. It will stop saloon-keepers from getting the upper hand; it will stop folks from stealing harnesses; it will bring about a pleasant and friendly solution of the difficulties between labor and capital. How shall we proceed toward seeking God's kingdom and his righteousness? Why, wake up and help to fill the places of worship that our fathers have scattered over our land. Go next Sunday; take everybody along you can get hold of. Do not wait till spring; do not stop on account of the weather; lend a hand toward hunting up the lost sheep of the house of Israel, and ye shall have peace on earth and treasures in heaven. By the way, some of our unbelieving friends suggest that we *Christian* people are looking toward heaven *after* this world is done with. Well, I want to tell you that such people are behind the times. The Christian people of the present day—that is, the intelligent and wideawake ones—believe in heaven here on *earth*, and they believe in it right along every day, and are trying to bring it about. "Thy kingdom come, thy will be done on earth as it is in heaven." Does that mean that we are to wait until we are *dead*? I am rather afraid the Christian who does not try to make a heaven or to hunt up a heaven *here on earth* will never find one when life is past.

HIGH-PRESSURE GARDENING.

BY A. I. ROOT.

HIGH-PRESSURE GARDENING NOV. 1.

Did you ever! This month of October—at least the latter part of it—has been almost the best month for gardening during the whole year. There has been no frost, but abundant warm rains, and every thing that was not killed by the frost three or four weeks ago has just been booming. The value of elevated land for late garden crops comes in finely right here. Potatoes and tomatoes on a hillside are still green and growing, when on the low grounds they were killed long ago by the frost; and the late tomatoes bring fully as good prices as they did during the first of the season.

*The professor of religion who stops going to church will be just the man to listen to a suggestion from Satan, that there is something unfair about his neighbor having *five* farms while he has none at all. After awhile he will be ready for the suggestion that it is no more than fair that he should help himself, in order to make things right. May be he would not take a harness right away, but he will after awhile. When he becomes hardened a little more he will be ready for bloodshed and all the rest.

Beets that were put in late are just growing famously; and cabbages that we despaired of are heading up as nice as any thing I ever saw.

The only real nice cauliflower of the season is now being harvested; and, by the way, I am satisfied, from several years' experience, that the very best time in the world to raise cauliflower is in October—sometimes clear into November. Sow the seed in July, and put out your plants in September and October; keep them cultivated; and by having them thus late you will have very little trouble from the cabbage-worm or blue aphid.

We are also going to have a nice lot of extra fine celery; in fact, we are now selling about as fine celery as I ever saw. It stood all through the summer without making any growth of any account; but since the fall rains it has started up and is doing beautifully.

We might have had some cucumbers, and done well with them, if we had only put them in our plant-beds and covered them with sash when we had those frosts.

Our Grand Rapids lettuce, in those beds spoken of elsewhere (over the exhaust-steam pipes between the house and factory), are just doing grandly. Some of our late onions, that would not grow on account of a lack of rain, have started again; and although they will not ripen bulbs, we are selling them on the wagon for bunch onions pretty fairly.

Who ever heard of green peas the first of November? Well, we are having real nice ones. The frost made some of the pods look speckled; but since then the peas have made a new growth, and are now full of blossoms and new peas, and we are having quite a good many pickings. They bring 8 cts. per quart readily. It is a little funny that frost hurts peas in the fall, while in the spring they will stand quite a freeze.

Everybody is wanting peppers now; but ours were not planted so we could cover them, so we have not any at all.

You remember I told you about the Rural New-Yorker potatoes. Well, we dug from that piece ($\frac{1}{8}$ acre) 116 bushels of the finest potatoes I ever saw in my life. Some old farmers said that, during a dry season, there might be a great growth of vines, but there would not be any potatoes worth speaking of. Well, all the potatoes of this particular crop are large and smooth. One great smooth nice-shaped potato weighed 1 lb. 11 oz., and there are hundreds of them that weigh over a pound each. The ground was heavily manured last fall, and sowed to rye. The rye was turned under just before the sixty-hour rain, and this rye kept the ground up comparatively loose. After the rain was over, as soon as the ground was sufficiently dry we worked it up fine, soft, and mellow, and planted our potatoes. It was so late in the season they had long sprouts on, and were a good deal wilted; but we cut them carefully, without breaking many of the sprouts, and covered them nicely, and gave them good cultivation. If it had not been for this crop of Rurals I should have begun to think my ground was not suitable for potatoes, and that I did not know how to raise them, even if the ground were suitable.

We are now having the only real clean smooth radishes we have raised this season. All summer long our radishes, and, later, our turnips, were scraggly, wormy, and bitter; now they are smooth, clean, and crisp. We sold our first crop of turnips at 10 cts. a peck, and could not get rid of them at that price; but before I knew it the boys were getting 25 cts. a peck for the late ones. When I remonstrated for charging so big a price, they said the turnips were so handsome and crisp that folks paid it without

saying a word, and that seemed to be a conclusive argument. If the people only knew how many of our crops had not paid the cost of the labor during the late drouth they might have a little charity for us, even if we do take big prices when we have nice stuff.

HORSE RADISH; HOW TO FIND A MARKET FOR IT.

Mr. Root:—Do you handle horseradish in any shape? If so, I could furnish you almost any amount of roots this fall or next spring. Do you know of any machine for grinding or grating the roots, and is there a market for it put up in bottles? Any information in regard to the horseradish business will be thankfully received.

We had the best run of clover honey this season I have known for many years; but bass-wood and buckwheat was a failure.

Mexico, N. Y., Oct. 3. GEO. T. WHEELER.

[Yes, friend W., we do handle horseradish-roots, but I do not believe it would pay you to ship so far as this. We pay from one cent to three cents per lb. for roots washed and scraped, ready to grind up. The price depends upon whether the roots are smooth and clean, or scraggly and not very well cleaned. The machine for grinding them is very simple. A tin tube about the size of a pint cup is fastened to the end of a wooden mandrel. This tube is punched full of holes, like a horseradish grater—the burr, of course, being outward. You can revolve the cylinder by hand, by foot, or by steam power. It should be on an incline, so the grated horseradish will drop out from the open end. The roots are pushed into a suitable hopper, so as to strike against the rough tin cylinder. We put it up in Muth's 1-lb. honey-jars, such as are advertised in our price list. We retail it around the town at 15 cents per bottle, and when the men go round the next time they pay 5 cents back again for the empty bottle; so the consumer pays only 10 cents for the horseradish. The whole expense of the horseradish, grating it up, and the white-wine vinegar, is only about 4 cents per bottle. You can use cider vinegar if you choose, but the product is not so attractive to customers; and, besides, it will not keep nearly as long as where you use the best white-wine pickling vinegar. If put up with the latter at this season of the year, and kept in a cold room, it ought to keep till spring. We think, however, it is best to put it up about once in two weeks.]

WHY SOME OF US HAVE CONFLICTS WITH SATAN; A SUGGESTION.

I read a story, when a boy, of a learned judge in the South, who was an unbeliever, but who had a colored servant in whom he had great confidence, who was an earnest Christian. They talked freely together on their journeys over the judge's circuit, and the servant often complained of his troubles with "de debil." The master, however, was not troubled in that way, and did not believe in the existence of Satan. On one occasion, the circuit having been completed, the judge decided to go hunting ducks. Approaching a pond with a goodly number of birds on its surface, he crept cautiously within shooting distance, and fired both barrels of his gun. Four or five ducks were killed and as many more wounded. Leaving the dead ducks where they were, the judge began running and splashing around in a great hurry after the wounded ones, collecting the dead ones at his leisure.

On returning to the carriage with his game, he was accosted by Sambo with, "I got it now, massa."

"Got what?" asked the judge.

"Bout de debil," replied Sambo; "you pay no 'tention to de dead ducks, but go splashing 'round after dem dat's tryin' to get away. So de debil sees me tryin' to get away from him, an' he keep at me *all de time*, but he jes' let you alone, cause he knows he got *you*, shore!"

BURDETT HASSETT.

Bonair, Ia.

OURSELVES AND OUR NEIGHBORS.

The truth shall make you free.—JOHN 8:32.

There are so many grand lessons to be learned at the World's Fair that I shall never be able, probably, to even speak of all of them; but I am going to take them up from time to time as they occur to me. The first thing that met my gaze and pleased me were the arrangements for pure drinking-water on the grounds—first, the free drinking-water. Large tanks were to be met with all over the grounds and throughout the buildings, labeled something like this: "Sterilized filtered water;" and this water is very fair—much better than we ordinarily find in traveling through any city or country. It comes from the lake, eight miles from shore, if I am correct. The great city of Chicago has been at great expense to provide good water for her people. But besides this were other stands for drinking-water also, scattered everywhere, so that one would scarcely be obliged to make an inquiry. These booths were plainly lettered, "Waukesha hygeia spring water—a penny a glass." A good many may complain of being obliged to pay for drinking-water; but I don't. I find it a great privilege to get the most beautiful spring water at any time I feel thirsty, for only a penny a glass. Let me digress a little.

In this big world of ours, it is a very hard matter indeed to keep any sort of institution in good running order without pay. One of my hobbies has been for years to furnish the public good drinking-water, free of charge or annoyance, and I am at it yet. But let me tell you some of the difficulties. If the water is to be pumped, almost any pump that can be procured will soon be out of order, and prove to be a bill of expense. To get rid of the pump, our big windmill on the hill keeps the water so it runs itself by opening the hydrant. Well, in this case even the best hydrants are soon worn out. You see, we have a liberal patronage here. Another thing, the expense of drinking-cups is quite an item. One might think the great thirsty world would be so thankful that they would not carry away the bright new tin cup. Alas for human depravity! every little while our cups are carried away. Tie them up with a string? Yes, we tried that; but even the stoutest string was broken and the cup gone. A chain did some better; but it was an annoyance by getting tangled up and hindering people. Sometimes two or more vehicles would stop at once near the hydrant. Ladies would like a drink without the necessity of getting out. If the cup were chained up they would be bothered, and we should be bothered by their coming into the store for a cup that was not chained.

Now, it is not altogether *vicious* people who take away our cups. A few days ago a carriageful of ladies stopped for a drink. The cup was passed from one to another without obliging them to get out. When they were gone the cup was missing. They seemed to be intelligent, well-bred people, and I *knew* they did not *steal* it. Let me tell you what they did do. In the afternoon they came back laughing and chatting. As they passed along, one of them took our tin cup, and, to save getting out or stopping the team, she threw it toward the hydrant. Then they had a good deal of merriment and drove off. Had I not seen it, and picked it out of the dirt, the next team would have crushed it into the mud. People are thoughtless; so I have decided to foot the bill for tin cups and repairs to the hydrant, and get my pay in seeing people refreshed and made happy, and many times induced to drink water

when they otherwise might be induced to drink something else.

Now, while there are vicious people and thoughtless people in the world, there are also thousands upon thousands of good people who love humanity, and who came not into the world to be ministered unto, but to minister to others. It is these people who furnish drinking-places and cups; and there are many of these people who would be glad to help pay the expense of public drinking-places if they were permitted. This enterprise on the grounds of the World's Fair is the brightest invention in this line that has ever come under my observation. The whole establishment, or little booth, is neat and artistic. Then there is a lot of drinking-glasses made of pure flint glass, and so thin that, even in hot weather, the drinking-cup is not heavy enough to cool off perceptibly the contents. A great heavy glass, or a heavy dish of any kind, is not the thing for a drink, unless, indeed, your heavy dish is deposited in the spring under water when it is not in use. Well, when you want a drink of Waukesha spring water you put a penny in a slot. The glass is all ready, right under the outlet. This penny, by automatic machinery, lets out a little more than a cupful of water. The surplus rinses the tumbler all over—outside as well as in; and as this pure spring water leaves no residue, the sparkling glass, wet all over, as if it had been dipped in a spring, glistening with its contents, stands before you. For fear you may not have a penny handy, a lady sits at the counter, with heaps of pennies—heaps of five and ten. She swaps the pennies for nickels or dimes, sees that the glasses are put back ready to be filled, and looks after the machine so that nobody steals the beautiful glass cups. The pennies pay her for her supervision—pay for the automatic machinery, and, I suppose, pay for laying the pipes away up into Wisconsin, more than a hundred miles, to the locality of these beautiful springs. I for one feel glad to think that it was my privilege to contribute pennies to help pay for this wonderful enterprise. Why, if such an arrangement could be started and kept going on the streets of our towns and cities, furnishing water absolutely pure, it seems to me it must be patronized tremendously by a grateful public. During the warm days, all these places for drinking-water were patronized heavily; but by far the greater part of the people seemed to prefer to pay the penny rather than to go to the free places. The fact is, everybody seemed to pronounce the spring water the nicest and most beautiful water they ever tasted. I am glad to see that I am not alone in my decision that pure soft water is more wholesome than the various hard waters containing such a large amount of chemicals. I want drinking-water so pure that, when it evaporates on the surface of a glass, no cloudiness, indicating the presence of chemicals, is to be found.

Of course, there were drinking-places for other things than water. A great many of the foreigners, and perhaps a good many who were not so foreign either, patronized the beer-establishments. A glass of beer could be bought anywhere for 5 cents, while a cup of coffee or lemonade was always 10 cents. Let me say, to the credit of the Fair people, however, that a glass of milk was also 5 cents. But I want to say a word about the beer. I do not know in regard to its quality; but these friends of ours, whom perhaps we do not know very well, seemed to have a fashion of sitting down and sipping their beer leisurely. Young America would take a great big glassful at one swallow, and perhaps another and still another. Our German people sit down to a table, and sip

leisurely while they eat their crackers and cheese—perhaps taking 15 minutes to drink a single glass. In this way they feel little or none of the intoxicating effect; while if a whole glass or more were poured down into an empty stomach it would produce at least a *little* intoxication. Our cousins from across the water have been so much accustomed to their way that they would not only regard it as pretty hard, but unkind and uncourtous, if they could not come to the World's Fair and do as they do at home in their fatherland. Now, I am not defending the sale of beer at the grounds of the World's Fair, nor on any other fairgrounds. I am simply suggesting that we ought to take all these things into consideration when we act, and go forward in our temperance work with at least a kindly and charitable spirit.

It seems to have been the intention of the managers of the World's Fair that the principal part of the eating and drinking, as well as all sleeping, should be done outside of the gates. In fact, there is not room inside. And in this line I would have tried, had I been one of the managers, to make these foreign friends feel that it was not so very unkind after all to ask them to drink their *beer* outside of the grounds if they must have it at all. While beer was five cents a glass, lemonade was 10; soda water 10 also, and with ice-cream 15. The only five-cent beverage besides beer and milk was orange cider; and the orange-cider stands were patronized to such an extent that, on Chicago day, a great many stands sold out entirely—could not get enough. During the afternoon I saw a great string of people. It was in the form of a circle, starting from a refreshment-stand, and going out in a great big loop, coming around again to the stand. It was formed of people getting in line so as to get their turn in getting orange cider. They did this thing at the Ferris wheel, at the ticket-offices, and many other places where there was liable to be a dispute as to whose turn it should be to be served first. The multitudes had, it seems, adopted it, deciding it to be the only fair and courteous way; and these loops of humanity, during the days of the greatest rush, were an amazing spectacle. It rejoiced my heart to see them; and in the light of our text I believe it was *God's* work. In this way women and children, as well as great big stout men, must take their proper allotted place in waiting; and nobody seemed inclined to make "might right." In fact, these exceedingly nice people—the Columbian Guards—would have interfered if big people, presuming on their bigness, had undertaken to be selfish. The Columbian Guards are good-sized men—that is, they are tall if not large around. They are supposed to be tall enough to look over the crowd and see what is going on, and they will tell you any thing you want to know, with the most pleasant good nature, even if a line of people stands waiting for a chance to put their questions. I was asking them for information almost constantly, sometimes waiting for my turn, but I did not hear an uncourtous or uncivil reply while there.

My talk to-day must necessarily be rambling, and I want to digress a little here. One of the first things Mrs. Root did was to lose her silk umbrella. She left it in a closet. One of the guards, however, told us just what to do; and next morning when we presented ourselves at the "Lost and Found Bureau," and described the umbrella, the officer in charge put his hand on it instantly, and handed it to her. Did anybody ever hear of having a lot of officers employed to pick up things people leave around without their names attached, and deliver them safely, before? It is the same way with chil-

dren. On Chicago day, I am told, seventy little friendless wanderers were taken charge of by the bureau devoted to this purpose. They were fed and amused, and catechised in regard to their parents, until said parents found out about the "Lost-Children Bureau," and came after their "property."

But I have not got through with drinks yet. Enormous quantities of orange cider were used up. People laughed at me when I maintained it was genuine. I told them I had seen heaps of cull oranges at Riverside, Cal., almost as big as a meeting-house. The only use made of them was to get out the seeds by machinery, and use the seeds for raising seedling stock to be grafted. I soberly assured the incredulous that this orange cider was made of these refuse oranges; and in different parts of the grounds you might have heard the venders of orange cider saying, "Orange cider! absolutely pure juice of oranges from Florida." As I looked at these men I did not think it possible that they could so unblushingly tell an untruth. Pretty soon I heard another vender say, "The *only* pure orange juice sold on the grounds!" and then some other vender took up the strain and said *his* was the only absolutely pure orange juice. To cap the climax, a friend of mine who runs a chair told me that an Oberlin student was offered a position at good wages; but one of the conditions was, he was to tell the great crowds that the orange cider was absolutely pure orange juice, while he and all the rest of the officers knew perfectly well that it was manufactured at that very time, right under their eyes, every day, right on the grounds, as fast as the public demand required it. Thank God there was at least one Oberlin student who would have nothing whatever to do with such a business, no matter how much pay they offered him. Now, I did not start this paper with the view of complaining. I made up my mind to accept what I found at the great World's Fair, and do very little criticising; but in the name of the government of the United States, and in the name of the great God who made us all, and who made us brothers, even though the wide seas separate us, I do protest against this awful untruth; and to the officers of the World's Fair, or whoever else permits this thing to go on unproved, I call them to order, and ask them if they can hold up their heads and look an honest man or woman in the face while being a party to this thing that should make every citizen of our country blush and cry out for shame. May God help us if we have got to such a pass that this thing can be carried on publicly and unblushingly. If orange cider is not orange cider at all, but something manufactured from chemicals, how about our tea and coffee, our butter, our maple sugar, and, finally, our honey?

Ever since this thing was told me, I have been wondering whether it were not a mistake, and that some real orange cider has been brought from California or Florida. I am told there is not a drop of real orange cider offered for sale in our land; and yet the so-called stuff is to be purchased in every little town, and at almost every refreshment-stand. God forbid! How can we teach our children the grand truth that stands over the arch of the peristyle, "Ye shall know the *truth*, and the *truth* shall make you free," and then admit to them that all the orange cider sold on that great fair-ground is not made of orange juice at all—no, not even while the venders vie with each other in making themselves hoarse by insisting again and again, with all the vehemence that long practice has taught them so well, that it is pure *orange juice* when they know it is a vile falsehood? The excuse has been urged, that

physicians pronounce it a refreshing and healthful drink, and the people like it, and hand over their nickels. But I do not think this excuse helps it a particle. If people want it, and it is a healthful drink, by all means let them have it; but call it *what it is*. For the sake of the example before our children; for humanity's sake, and for God's sake, give it some name that does not brand all who have to do with its sale as liars and cheats. I think it quite likely that, under certain conditions of the system, a little tartaric acid and sugar with drinking-water may be wholesome and beneficial to the health, just as lemonade is wholesome and beneficial, or just as soda water and seidlitz powders are beneficial. But lies are never beneficial to humanity. Jesus said: . .

Ye are of your father the devil, and the lusts of your father ye will do. He was a murderer from the beginning, and abode not in the truth, because there is no truth in him. When he speaketh a lie, he speaketh of his own; for he is a liar, and the father of it.

THE INTERNAL WATER-CURE; DOCTORING WITHOUT MEDICINE, ETC.

Several of the friends are inquiring for the results of my experience, and perhaps experiments, in the above line up to the present date. In regard to the water-cure, I have no reason to change my opinion, with the following exception: Where one gets into the habit of using hot-water injections every day he will soon find that he is losing the benefit of at least a part of the food he eats. This is indicated by exhaustion, more or less, just before meal-times. The point is, that a considerable part of the nutriment contained in the food, and very likely a most essential part, is taken by the proper organs while the residue is in the colon. In good health it should remain in the colon until every particle of nutriment is extracted. The excrement should be in hard compact lumps or balls. It reminds me of getting beeswax out of old combs. Unless the residue is put under heat and pressure both, a little wax will remain. If the hot-water treatment be used in the morning, before breakfast, very likely the result is not as debilitating; but if your digestion is disordered you will, perhaps, sleep a good deal better at night by having the contents of the colon removed. Now, where there is headache, distress in the bowels, or perhaps sick headache, it is better to remove the cause of the mischief than to let it remain. But a much better way is to get the digestive apparatus to work all right itself, without assistance in the way of the water remedy. Perhaps this can not always be managed; but I think it can a great many times by being very careful not to eat more than your system can properly take care of. Do not overeat, *whatever* you do. Another thing, when your food distresses you, and digestion is a long while under way, try cutting off *liquids* while at your meals. A good many times I think one receives benefit by omitting even milk; or perhaps you can use only a little milk while eating. An hour or more after a meal, if you still feel thirsty, take some water, or milk if you choose, or a little fruit, that you have found by experience agrees with you. I think a good many people suffer from indigestion because they keep diluting the gastric juice by too much liquid while eating. I would still also recommend having your supper quite early, or, if you can manage it, skip supper entirely; or have for supper new milk right from the cow—nothing else. If you find some graham gems with the new milk do not distress you, take

them also. Now a word more about the water-cure.]

Where your digestion has got into a sort of chronic fashion of looseness, so that the hard balls that I have mentioned are not formed in the colon at all, the hot water is one of the best remedies to get nature into the right channel I know of. The simple operation of thoroughly washing and rinsing the colon seems to assist nature greatly in getting things in line*, and I think this method of doctoring without medicine is ever so much better than the use of any sort of drugs or even medicine of *any* kind. But after these things begin to go in the natural way, I would drop the water-cure. It has been suggested that, after depending on artificial means so long, nature will get so she will not work without it. I do not think this is true. I used the hot water every night for several months at a time; and then on going away from home I dropped it suddenly. Nature managed all right, but I did not sleep so well nights for a while. After a very few days, however, every thing seemed to go just about as well as when the hot water was used; and I am of the opinion that the colon *should* retain its contents until morning. In fact, I am quite sure one has more strength and endurance when he does so. There seems to be a final working over, and squeezing the contents of the colon, that is important—at least, you will find you have more endurance when the colon is given plenty of time to get through with the work; and I believe I feel the best when I am admonished, *some time during the forenoon*, that every last bit of nutriment has been extracted, and that nature has no further use for the accumulation.

The facts given above are not from my own experience alone, but I have talked with others in regard to the matter, and I feel pretty sure I am right. The proper use of the internal water-cure is a wonderful invention for humanity; but be sure you do not abuse it. When I find I have eaten something that does not agree with me, and that old peculiar headache begins to set in, I start at once for the hot-water treatment, no matter whether it be morning, noon, or night. Better get rid of the cause of the mischief, and commence over again, than to suffer headache and distress in the digestive organs.

One thing more: If you have reason to think that nature has not of herself, or will not of herself, empty the colon as *thoroughly* as it ought to be emptied, try the water after nature. Let nature do the work if she will, and give her full sway; but when she will not, and when you can, by so simple a means as the use of pure water, fit yourself for your duties in life, use the water; and, above all, when you feel your ignorance in regard to the workings of this complicated piece of mechanism God has given you—the human body—do not be backward in going to *him* and asking him to give you wisdom and understanding in that very line. Shall not he who fashioned these curious and intricate abiding-places for the human soul give us wisdom and guidance in regard to them when we come to him?

*You know doctors have been telling us of the terrible diseases that result from letting the excrement of a sick person, in consequence of proximity of privies to wells or cisterns, get into the drinking-water. It is a terrible poison. Well, I have thought that, when one's health is out of order, the poisonous matter remaining in the colon may act like yeast to renew the disease day by day; but the thorough rinsing, with sufficient water, cleanses the colon, and permits the fresh good matter in it to perform its proper office.



He that followeth me shall not walk in darkness.—JOHN 8:12.

OUR bees are all in their winter quarters—in fact, they have been, for that matter, for some time back. How are yours? Better late than never; but—*better never late*. Better still, if we had not been so last fall.

THE official report of the North American will appear in the *American Bee Journal*, and, later on, will be published in book form, for particulars regarding which, address G. W. York, editor *American Bee Journal*, 56 Fifth Ave., Chicago.

AFTER the season's sales of queens and nuclei, and after the fall's uniting, we have, all told, only 106 fair colonies put up for winter. They are all outdoors, packed in chaff or planer-shavings. Some are in two-story chaff hives; some in the one-story, and the rest in winter cases. All the clusters are under absorbing-cushions, with the exception of one, and that has a sealed cover. This is really all we care to risk that way, after last winter's experience.

MR. ALLEY, of the *Apiculturist*, has a characteristic, almost pleasant way of criticising those who differ with him, even if he does go at them sometimes with a club. Our opinions have come in the way of his criticisms at numerous times; and although his views, in our estimation, are, sometimes, extreme, his comments, instead of irritating, rather please us. Of late, our Massachusetts editor has been firing his gun at Dr. Miller. When we saw the doctor last he did not look as if he had been hit. Mr. Alley is evidently shooting too high.

ELSEWHERE Rambler refers to an extractor that throws out the honey from combs that revolve edgewise. He says that a 12-year-old boy, Claud Henderson, extracted with this machine 12 tons of honey, and that the machine runs easily. Our readers will remember that, three or four years ago, we were experimenting with an extractor built on this principle. As the combs did not have to be reversed, the idea at the time struck us very favorably, and several times we were on the eve of success. But our experiments showed that extractors of this description did not do the work as clean and with as little expenditure of power as those that receive the combs in the regular way. However, the fact that that boy extracted 12 tons with such a machine is enough to command attention. Perhaps Mr. J. F. McIntyre, who has made the subject of extractors quite a study, can give us some further hints along this line.

In his article in another column, Rambler tells quite graphically of the murder of a bee-keeper. Both the murdered and the murderer were well-to-do people. Mr. Bohn himself seldom drank, this being only the second time. The question comes up, as it does every time, "Who was the real murderer—the saloon-keeper who sold the liquor that crazed the men and made them not themselves, or the man who pulled the trigger with result so fatal?" The probabilities are, that both are responsible; but how far either one may be guilty, only God can tell. The time is surely coming when the

saloon-keeper will come in for his fair share of criminality; and, in our opinion, it should be a good big share. We regret to say, however, that the bee-keeper was the first one to resort to the use of the deadly firearm, and he was just as great a murderer at heart as the one who killed him—yes, more guilty, because his opponent may have been acting in self-defense.

THE BIG ATTENDANCE AT THE CHICAGO CONVENTION, AND WHAT IT MEANS.

ELSEWHERE we have referred to the large attendance at the North American convention. Some of our European bee-keepers, seeing this, might feel that we have not much to brag over, considering the fact that they sometimes have as many as 400 or 500 at their conventions—at least, we have been so informed. But if our European friends will consider for a moment the vast extent of the United States, and that some of our States taken alone are larger than France or Spain, and that England is no larger than Illinois, they will see that the bee-keepers who attended had to come in some instances thousands of miles, and thus they will get a better idea of what our 225 enrollment means to us Americans. Or let them imagine the whole continent of Europe under one government, having one central bee-association, and that we are to have a convention in Constantinople. How many bee-men in Scotland would feel like taking such a trip? or how many would travel from Moscow to Paris, or from London to Athens? These tremendous geographical distances actually confront us here. When a bee-keeper goes from San Francisco, on our Pacific coast, to St. Joseph, Mo., at our next convention, it is equivalent in distance to a man in London going clear across Europe to the Ural Mountains; and yet such a trip takes him only half way across our country, in a bee-line from San Francisco to New York. Another thing, our population does not exceed the fifth part of Europe, hence we have five times the area for gaining a subsistence without resorting to apiculture; and this alone would greatly reduce or keep down the number of bee-keepers. Every thing considered, the attendance at Chicago was very gratifying.

PHOTOGRAPH OF THE CHICAGO CONVENTION.

AN attempt was made to photograph the bee-keepers while in attendance at one of the sessions of the Chicago convention. The results were very good, considering the poor light, and the fact that the bee-keepers were scattered over the whole room. Some of the faces are necessarily out of focus, but the majority of them come out very well. In the foreground appears the familiar face of Hon. R. L. Taylor; also that of Hon. J. M. Hambaugh. Between these two is W. L. Coggs, an extensive bee-keeper of New York. Toward the center of the room will be found the editors of the *Review*, *Canadian Bee Journal*, the *American Bee Journal*, and GLEANINGS. The last two sit in one chair, arm in arm. While this was purely accidental (there being a scarcity of chairs) we are glad to say that it indicates pretty fairly that the editors of two bee-journals can not only be on good speaking terms, but they can sit together in one chair, sleep together in one bed, or ride together in one sleeper, all of which is literally true, as we speak from personal knowledge. At one other time Bro. Hutchinson and Bro. Holtermann occupied the same chair, and there is no indication that these pleasant relations on the part of any of us will ever be "strained."

Near the editors of the bee-journals will be seen Mrs. Lucinda Harrison; Dr. C. C. Miller,

president; Frank Benton, secretary; Dr. A. B. Mason, an ex-president. In other parts of the room are the faces of prominent bee-keepers, but they will scarcely be recognized, as they happen to sit in such unfavorable positions.

Mr. W. Z. Hutchinson, of Flint, Mich., owns the negative from which this photo was made, and he will supply mounted prints of it at 50 cts. each. He also photographed himself (by the way, he is a first-class amateur photographer) and all of the principal honey-exhibitors, a print of any one of which will be sent for 50 cts. The question may be asked whether we ourselves or Mr. H. will reproduce the photograph above mentioned. As for ourselves, we would say that the picture is not ours to engrave, even, if it would come up well in half-tone.

TRAGIC DEATH OF TWO YORK-STATE BEE-KEEPERS.

ONE of the greatest enjoyments at the Chicago convention (as it is in every convention) was to greet old-time faces—faces of those whom we have either met before or have known quite intimately from their writings. Little did we think, however, when we shook the hand of that kindly old gentleman, Mr. J. VanDeusen, of J. VanDeusen & Sons, manufacturers of flat-bottomed foundation, of Sprout Brook, N. Y., that he was so soon to meet with so great a sorrow as that of the loss of his son and main stay in the business—C. C. VanDeusen—and his estimable daughter-in-law. The worst part of it is, they suffered death in a terrible railroad accident at Battle Creek, Mich., on the morning of Oct. 20. The accident was the result, as perhaps most of our readers know by this time by the press reports, of a terrible collision of railway trains. Among the 25 or 30 who were killed are included the names of our two bee-keeping friends. Mr. VanDeusen, it seems, was injured, and died shortly after his wife. His wife was pinned between the telescoped cars, and at first had no doubt of her escape; but as the wreck took fire it began to be evident that she was in danger. Before she could be released by the strong men, the flames had claimed their victim. We clip the following from the *Cleveland Leader*:

"You sha'n't burn, we'll get you out," cried the men heroically, as they wrestled frantically with the splintered timbers. There was a lull of speech for five minutes. The rescuers had become giants in strength and madmen in desperation, and they struggled wildly with the tangled mass of wood and iron. The woman was silent, and gazed imploringly and inquiringly into the faces of the firemen.

A MARTYR'S STRENGTH.

"My God! O my God!" suddenly burst from the lips of one of the heroic workers, and in that despairing heart-cry the helpless woman read her death-warrant. She gave one agonizing wail, and then her woman's weakness gave way to a martyr's strength.

"I can die—oh, yes! I can die if I must," she said soothingly to the strong men who were weeping in their impotent efforts. Again they struggled breathlessly to the rescue, but the flames were encircling them. "I am a Christian," she said resignedly, and a moment later her voice was raised in prayer. The flames completely encircled the helpless victim, and the firemen were driven away. As the blaze caught her arms, and as she fought to keep the flames from her face, she told her name and address, and left messages of love to her husband and family. The closing minute was a pathetic struggle against the inevitable; but it was the flesh that fought, and not the spirit. The white face of the woman gazed heavenward, and her lips moved in prayer. Even the fury of the flames that wreathed her limbs and blistered and curled the white flesh of her arms, was powerless to provoke a scream. Suddenly there was a swaying and surging of burning timbers around her. A wild groan

burst simultaneously from the lips of the spectators, and strong men wept. Through their tears they saw the flames sweep around the face of the martyred woman, and her hair burned wildly for a moment. The head dropped to one side; as the victim inhaled the flames, the praying lips were stilled, and the soul of Mrs. VanDeusen had passed beyond the fury of the elements of earth. An hour later the husband, for whom she had left a loving message, joined her in the world to come.

In one sense the story above is awful, and in another it is most beautiful. Bee-keepers all over our land may be proud to know that, in their ranks, was once a woman who could die so heroically and bravely such an awful death, and yet without fear and without a scream.

Our business acquaintance with the VanDeusens has been exceedingly pleasant. Mr. C. C. VanDeusen, the one who died, was the bee-keeper of the firm, and our back volumes years ago show that he wrote a number of valuable articles. Along about this time a very pleasant correspondence sprang up, and it was evident that both our friend and his wife were earnest Christians. May the story told above so graphically, show that there is something in the life beyond to sustain one in the terrible hour of physical torture. We would not give the details as above, except that they teach a beautiful lesson.

TRADE NOTES.

PERFORATED ZINC.

THE EXACT SIZE THE PERFORATIONS SHOULD BE, ACCORDING TO DR. TINKER.

A short time ago we wrote a letter to Dr. G. L. Tinker, of New Philadelphia, O., asking his opinion with regard to the size of perforations as discussed editorially on p. 723. He has kindly replied; and as the article is a valuable one we commend it to the careful consideration of every one who is interested in keeping queens out of the surplus apartment of the hive.

Friend Root:—Your kind favor concerning an editorial on page 723 is at hand. I had only just read it, and shall be pleased to give what information I have on the subject.

The sample of zinc through which one of Dr. Miller's queens passed was tested by my steel gauge, and the perforations were found to be smaller than in my zinc, proving beyond question that the queen was not a fully developed one. I am aware that such undeveloped queens can be easily reared in full colonies, and it can be done as follows: Select a time during the season when little or no honey is coming in. Remove the queen from a strong colony and let them rear a queen. The usual number of cells will be started, but, without exception, every one of the young queens will be small or undeveloped—not much if any larger through the thorax than a worker. These queens will also prove short-lived and comparatively unprolific. They are generally superseded the second season. I once reared a lot of queens in the manner described, and had eight of them in one colony in queen-rearing chambers. I soon found that they could all go anywhere through the zinc like the workers, so that all were killed but one. Queens reared by the usual approved methods, or by natural swarming, were always safe in these chambers unless they flew out and entered the wrong place. On one occasion I had 30 of them in one colony. The zinc worked perfectly, and not a single queen passed it.

The trouble was, that the workers would feed only the young queens they had selected for mating, and the rest would not fly out to mate at all; so, out of 30 virgins I got only three or four laying queens.

Again, for many years I have every year had queens above and below my queen-excluders in every colony, and the excluder proves to be a perfect barrier to all queens reared in a proper manner. The conclusion, therefore, is, that, in the few instances where queens pass the excluder zinc, the fault lies not in the zinc but in the method by which the queens were reared. Hence it is important, first of all, that queen-excluder zinc should be of such size that the workers can readily pass, and that it shall in no way prove an obstruction to them.

I send you herewith three samples of queen-excluder zinc. The two-rowed strip has perforations exactly the right size. The perforations may be just a little larger, and work all right, but no smaller. The larger sample with opposite perforations will let many queens that are fairly developed pass it, so that the perforations are too large. The sample one-rowed strip has perforations too small, and yet it is probable that the perforations are only smaller than those in the two-rowed strip by $\frac{1}{5000}$ of an inch. Well, now, the question will arise, "How do you know there is such a small difference?" It is simply by testing it by the steel gauge, and by observing the bees in passing it. The size is not quite large enough to let the bee's head through without a liability of being caught by the top of the head and the tip of the mandibles right in the zinc. I have seen bee after bee caught in this manner, and often it is a minute or two before they can get loose. At first I supposed these queerly acting bees to be trying to gnaw a larger opening; but after a little I observed that they were really fast in the zinc. I then discovered how they got fast thus. It seems that a bee, before trying to pass a narrow crevice, tries first its head by bobbing back and forth. If it passes freely it then goes through at once, otherwise there is sure to be considerable delay, although it can just squeeze through. It appears, then, that the bee's head is longer than the diameter of its thorax, although I have never measured it. Your new zinc, from which Dr. Miller's sample was made, is so small that the worker-bee's thorax can just pass it easily, simply brushing down the hair on its back in passing, but too narrow to let the bee's head pass freely. It is probable that the bees get used to it, and each time in passing thrust forward the mandibles, or turn the head sidewise. However, if the bee is loaded it is very difficult for it to get through, and on this account I believe the perforations should be as large as I make them, and especially so since my zinc has proved so reliable as a queen-excluder.

I also include a sample of my drone-excluder zinc, to show how large the perforations must be to let the largest queens pass freely. I got this size also by careful tests, and it is pronounced perfect by Mrs. Atchley, Mr. Trego, and others who have used it largely, and have got the art of mating queens to select drones to perfection. There seems no longer any need of mating queens in confinement.

New Philadelphia, O. DR. G. L. TINKER.

[In the light of the above, and in the light of our own experience and that of Dr. Miller's, it becomes evident that it is impossible to make a perforated zinc that will exclude *all* queens. As Dr. Tinker well says, if the queen gets through a zinc it is not the fault of the *metal*, but because such a *queen* is not normally developed. If these small queens are little if any larger

than worker bees, so far as the thorax is concerned, and are below the normally prolific point, their heads had better be pinched. That being true, it may be laid down as a rule that, if zinc not exceeding $\frac{1}{1000}$ inch wide does not exclude, it is because the queen is not all that she should be.

We have carefully measured the samples of zinc Dr. Tinker sent, and find that the two-rowed strip referred to by him as being just exactly the right size measures in the width of the perforation $\frac{1683}{10000}$. The larger sample to which he refers, having opposite perforations, and which he says will let many queens that are fairly developed pass through it, has perforations $\frac{1715}{10000}$. This, he says, is too large, and tallies perfectly with our experience. The sample of one-rowed strip that he mentions as having perforations too small, measures $\frac{1683}{10000}$; and as between this and those first mentioned, the reader will see, by comparison of fractions, that there is, in fact, by actual measurement, a difference of $\frac{1}{10000}$ —confirming exactly what Dr. Tinker said would be the actual difference.

The next and last size mentioned—that is, the one that will let through normal queens and exclude drones—measures only $\frac{1683}{10000}$. We know that there are some queens that have actually gone through metal that measures only $\frac{1650}{10000}$, and this would leave a difference between the smallest queens and those normally developed, so far as the thorax is concerned, of $\frac{33}{10000}$. As this figure is a little hard to understand, we would say it would approximate very nearly $\frac{1}{3}$ of an inch. Now, perhaps in all this you may think we are splitting hairs pretty fine; but as we happen to possess a very delicate micrometer we might as well speak exactly as to approximate; for *approximate* figures would not show the difference between sizes of zinc that are so nearly alike.

Referring to the exactly right size of the perforated zinc, we would say we have experimented also upon this considerably; and we find that zinc $\frac{1650}{10000}$ or $\frac{1683}{10000}$ is too small; and that, while it will admit workers fairly, without loads, it will exclude them when filled with honey, or, at least, it is a very difficult thing for them to pass through. In our experience we have found no difficulty with zinc as small as $\frac{165}{1000}$, for all purposes in the apiary. Loaded and unloaded workers seem to pass through it quite freely. Now, in view of the fact that there are some small queens, and if it is a fact that the $\frac{165}{1000}$ does not hinder loaded workers, would not this size be nearer the "exactly right size"? Dr. Tinker is one of the "doctors" on the subject of zinc, and we should like to hear from him further in reference to this last point.

It might be well to suggest, however, that his bees are possibly a little larger than the normal Italians, for he has been making a specialty of the Syrio-albinos; and we believe he has had some Carniolans. We know it to be a fact that this latter race is a trifle larger than Italians—just how much larger we do not know. In the mean time we wish to express our thanks to the doctor for his very able article on a subject that has been more or less perplexing in regard to the reason why queens will sometimes get through zinc.

Now, Dr. Miller, it will be in order for you to give a history of that queen which got through perforations only $\frac{165}{1000}$ inch wide.]

HOFFMAN FRAMES.

A SUGGESTED IMPROVEMENT.

Herewith I send you a corner of one of the frames you made me last spring, which, so far as my experience goes, is a complete answer to your note following Dr. Miller's article on page

746. You made me 800 of these frames, and let me say that the material and workmanship of all were as perfect as the specimen sent. I have always used top-bars $1\frac{1}{2}$ inches wide and $\frac{3}{8}$ thick, with interspace $\frac{1}{4}$ to $\frac{5}{16}$, and was never troubled much with burr-combs. Such frames were too wide at the end, and unbandy to get hold of. This frame has Hoffman ends, $1\frac{1}{8}$ in. wide; top-bar $\frac{3}{8}$ thick, $1\frac{1}{16}$ wide, with projection $\frac{3}{8}$ square, which gives you a good finger-hold, and, what is important, gives the bees a free passage to the end sections above, directly up the ends of the hive.

Nine frames, when tightly wedged together, measure $12\frac{3}{4}$ inches, leaving the interspaces $\frac{3}{8}$ of an inch wide. The aggregate width of frames is reduced $\frac{1}{4}$ inch by indentation of the corners. This frame is strong, and always keeps its shape. Dr. Miller, I think, is right in the $\frac{1}{4}$ -inch interspace between top-bars; and if it falls only a small fraction below this the bees will close it with propolis, as noticed in the space of $\frac{1}{16}$ between the outside frames and wall of hive. Any unnecessary space that crowds a bee in passing will be closed.

I have used frames $\frac{3}{8}$ thick, and am getting rid of them as fast as I can. Bees, in reaching the surplus apartment, don't like to travel too far through dead timber; and in my experience they will commence work sooner over thin top-bars than very thick ones. With a $\frac{3}{8}$ top-bar and a full $\frac{1}{4}$ interspace, my queens, not once this summer, have entered the supers. I have no use for honey-boards, queen-excluders, nor any such fixtures. Five-eighths is thick enough for strength, and will, if the space is only $\frac{1}{4}$ inch, prevent burr-combs. J. A. SCUDDER.

Washington, Ind., Oct. 14.

[We have given Mr. Scudder's improvements on the Hoffman frame no little thought; and the more we think upon it, the more we appreciate at least one of the changes; and that is, narrowing up the projection or end of the top-bars so as to give more finger-room in handling. This also obviates the trouble of the splitting-off of the edges of the end-bars, and, to a great extent, to stiffen the frames. We would make the change on all of our frames were it not for the great expense. Such frames would cost considerably more. We commend a careful reading of Mr. Scudder's article, and we should be glad to receive suggestions and criticisms.]

STORING UP HEAT FOR FUTURE USE.

Since the world began, I can not find that anybody has, before my time, done any thing worthy of mention in the way of storing up heat for future use—at least, no one has succeeded in saving it in sufficient quantities so as to warm a building 36 hours after the fire that furnished the heat had gone out. If so, I should like to hear from such. Not only are our greenhouses warmed in this way over Sunday, but our dwelling also, 400 feet away from the fire. The heat is stored up in the heated earth under ground, and is carried where it is wanted by means of hot-water pipes. A. I. R.

THE NEW CELERY CULTURE.

Heigh-ho! I have finally succeeded in getting nice crisp celery by the new culture. It is, however, on our exceedingly rich plant-beds, where the ground is nearly half manure. The plants were thinned out to about 7 inches apart, and allowed to grow in the bed. Unless they are about so close, and there is a full stand, the stalks are apt to sprawl around, not compact like those banked up with earth; but when you succeed, the product is nice and the stalks are brittle and of beautiful pearly whiteness, and hardly need washing. A. I. R.

FREEMAN POTATOES.

In answer to a good many questions, I answer that the Freeman is an early potato—say a week of ten days later than the Ohio. The shape is much like the Ohio, only perhaps a little more flat or elongated, although many specimens are round. It has the smoothest eyes of any potato I have ever seen; and it is the cleanest and handsomest potato, I think, I have ever seen. The flesh is white the skin is white, or, rather, straw color. In quality it is almost if not quite equal to the Snowflake. Under favorable circumstances the yield is enormous; and if you plant them too far apart they will often grow too large. Notwithstanding, I have never yet seen a prongy Freeman, or one with small potatoes growing on the side of a large one. It is especially suited to the one eye system practiced by Terry. The fact that T. B. Terry plants his whole farm to the Freeman, and nothing else, ought to be a sufficient recommendation for it. Ever since the first year of its introduction the crop has been sold out long before planting-time; and thousands of dollars have had to be returned because the orders could not be filled. In view of this, I think it will be well to lay in a stock this fall, before freezing weather renders it unsafe to ship. For prices, see page 802. The small potatoes that we offer at \$3.00 a barrel are pronounced by T. B. Terry himself to be genuine Freemans. I mention this because there has been quite a little complaint that the seed received from different sources was not all true. When it was so hard to get hold of Freemans, it would not be very strange if something else by some mistake not to say intentional wrong—were sent out.

Books by T. B. Terry and Others.

The long winter evenings bring extra time for reading. A part of this time could not be more profitably spent than in reading the following rural hand-books which we send by mail at the uniform price of 40c each. The new edition of the A B C of Potato Culture, rewritten this season by T. B. Terry, will be completed in December. For 10c extra we will send at once a copy of the old edition and the new also when finished.



The A B C of Potato Culture.

Paper, 220 pages, 4x5, illustrated. This is T. B. Terry's first and most masterly work. The book has had a large sale, and has been reprinted in foreign languages. The second edition, reset and almost entirely rewritten, is just issued. When we are thoroughly conversant with friend Terry's system of raising potatoes, we shall be ready to handle almost any farm crop successfully. Price 40c, postpaid.

The A B C of Strawberry Culture.

Paper, 150 pages, fully illustrated. This is Terry's latest small book, and has received some very high words of praise. Who among rural people does not have a little garden-patch? If you would learn to raise in it that most luscious of all fruit, the strawberry, with the best results, you can not be without this little book. Even if you don't grow strawberries you will be the better for reading it.



Tile Drainage.

By W. I. Chamberlain. This is a valuable companion to our other rural books. It embraces the experience of forty years of one of our foremost practical agriculturists, who has laid with his own hands over 15 miles of tile. Paper, 150 pages, illustrated. Price 40c, postpaid.

Any one of above books sent free for one new subscription with your own renewal and \$2.00, the new subscriber to receive GLEANINGS the rest of this year and all of 1894.

Terry's First Large-Sized Book.

We have just received 100 copies of "Our Farming," from Wm. Henry Maule. Price, by mail, postpaid, \$2.00. If ordered by express or freight with other goods, you may deduct the postage, 15c.; or we will send the book by mail, postpaid, with GLEANINGS, for \$2.50.

A. I. ROOT, Medina, Ohio.

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After this month the club price will be \$1.10; and to those who are in arrears for GLEANINGS, the best club price is \$1.20, unless all arrears are paid and a year paid in advance. That you may know what others think of the *Farm Journal* we give here a few testimonials from leading agricultural writers and editors as to what they think of it.

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JOHN GOULD.

Aurora, Ohio.

Word from Joseph Harris.

The *Farm Journal* is full of good things. I do not see how any intelligent farmer, gardener, or fruit-grower can help reading it.

Moreton Farm, N. Y.

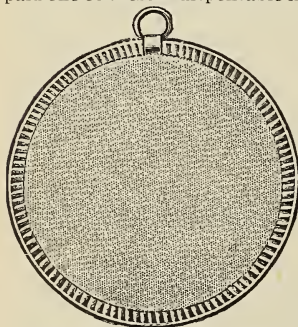
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E. S. CARMAN, Editor of the *Rural New-Yorker*.
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AUGITE STOVE=MATS.

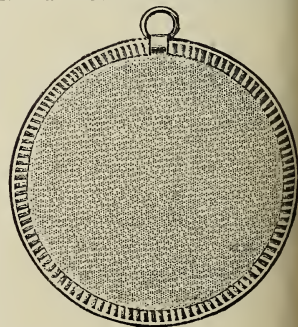
We have decided to continue our October premium for another month; that is, we will send free post-paid one of these indispensable household articles, on the same conditions that we send the *Farm Journal*



above—as a premium for a new subscription, or to those who pay for a year in advance before the time paid for is up, or who pay all arrears up to the end of this year, and for a year in advance. This offer will positively be withdrawn December 1st. After that date, to get the mat will require 10 cts. extra.

Canvassing time is here again, and many are improving their time and their revenue by selling these stove-mats. It is one of the most ready sellers of any thing that an agent can carry. We furnish them at \$1.00 per doz.; 6 doz., \$5.50; 12 doz., \$10.50; sent at your expense. If sent by mail, the postage is 6c each; 60c per doz. We get 10 gross from the factory every two or three weeks, and rejoice when the sales

increase, because of the blessing they bring to every housekeeper who uses them.



A. I. ROOT,

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Medina, Ohio.